

FLIGHT

The
AIRCRAFT
ENGINEER
&
AIRSHIPS

First Aero Weekly in the World

Founder and Editor: STANLEY SPOONER

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport

OFFICIAL ORGAN OF THE ROYAL AERO CLUB OF THE UNITED KINGDOM

No. 563 (No. 41, Vol. XI.)

OCTOBER 9, 1919

Weekly. Price 6d.
Post Free, 7d.

Flight

The Aircraft Engineer and Airships

Editorial Office: 36, GREAT QUEEN STREET, KINGSWAY W.C. 2.

Telegrams: Truditor, Westcent, London. Telephone: Gerrard 1828.

Annual Subscription Rates, Post Free:

United Kingdom .. 28s. 2d. Abroad 33s. 6d.*

These rates are subject to any alteration found necessary under abnormal conditions

*European subscriptions must be remitted in British currency.

CONTENTS

	PAGE
Editorial Comment	
The End of a Catastrophic Strike	1329
Aerial Mails in the Strike	1330
The Freedom of the Press	1330
A Useful Lead	1332
The Citizen Guard	1332
Flight—and the Men: Capt. P. D. Acland	1331
The Cato Sporting Monoplane	1334
Radiator Position	1338
The Cato 72 h.p. Aero Engine	1341
Prediction of Aeroplane Performance	1343
Beardmore Engines	1344
The Oertz Flying Boats	1346
Airisms	1350
The Royal Air Force	1353
Side-Winds	1355

DIARY OF FORTHCOMING EVENTS.

Club Secretaries and others desirous of announcing the date of important fixtures are invited to send particulars for inclusion in the following list:

Nov.	Entrance Examination for R.A.F. College.
Nov. 7-15...	Olympia Motor Car Show.
Dec. 3	"The Air Force." Lecture by Air-Commodore H. R. Brooke-Popham before R.U.S.I.
Dec. 19 to...	Paris Aero Show.
Jan. 4, 1920.	

EDITORIAL COMMENT

THE week-end saw the railwaymen's strike settled, thanks to the mediation of the leaders of the transport unions and to the spirit of reasonableness displayed at the eleventh hour by the Executive of the National Union of Railwaymen, whose precipitate hot-headedness plunged the railway services of the country into a state of anarchy. The terms of the settlement were such as the Government had offered before the strike, with the single concession that wages adjustment shall not take effect downwards until September 30, 1920, instead of on March 31 next. Even then no such adjustment can take place until the cost of living has fallen

to 110 per cent. above that of 1914. No sane person looks forward with very much optimism to any such fall in the cost of living, so what the railwaymen have gained by their action is precisely nothing at all. Under the terms of the original Government declaration, wages were not to be reduced until costs had fallen as stated, and if we agree that they are not likely to drop much within the next twelve months, we see that all the strife, all the dislocation of trade, with its consequent loss to the community, could have been avoided if the men's leaders had not been out to seek trouble. However, the thing is settled now, and there can be no use in bandying recriminations.

Among the lessons that have been taught by the strike and which we devoutly trust the nation will lay to heart is that of the power of road and aerial transport to bridge the gap caused by the total cessation of the railway services. The nation has been fed and supplied by motor transport running on the roads. The mails have been delivered and urgent passenger services conducted by aeroplane. Inconvenience and loss there has been undoubtedly, but the basic fact stands out that the nation has *not* been starved into submission. Instead, food has never been more plentiful since the Armistice, and eyes have been opened to the superiority of motor transport for many essential services. So much so is this the case that in many directions traffic which has hitherto been borne by the railways will in future be carried entirely by road.

All that has been achieved has been done, be it remarked, with an organisation got together almost at a moment's notice and with fleets of vehicles gathered from all corners of the country. Of permanent organisation there was nothing at all. Yet we have seen how well and smoothly everything has worked. All this will be lost, however, if the country is allowed to forget the debt it owes to the motor vehicle and the aeroplane. Beyond a doubt the real future of transport lies along the roads and in the air. We are not going to be so rash as to prophesy that the day of the railway is drawing to an end. Still, the railway has been our principal means of transport for a hundred years, and it would be strange if it were to remain so for all time—that would predicate a state of transport finality which we decline to believe has been reached. What we have to make sure of in the future is that the transport

services of the country can never again be held up at the behest of a small group of extremists, with or without reason on their side. We are firmly convinced that our best safeguard against this evil is in the strong development of aerial and road transport services which do not depend on the same circumstances as the more trammelled railways. We must develop these services strongly and rapidly until they have reached a stage when the business of the country can be carried on without interruption even though the railways should close down altogether and their tracks become rusty and grass-grown.

Aerial Mails in the Strike

In order to cope with the delay to the mails caused by the strike, the Royal Air Force and the Post Office combined to run aerial services between London and the chief provincial cities, and by the end of the week quite a number of them were working efficiently. The Post Office has been criticised for lack of initiative in the matter, and it has been pointed out that although the Air Ministry had months ago worked out plans for carrying on such services in case of emergency, the postal authorities were not over-anxious to avail themselves of the organisation. We do not think the criticism is altogether justified. It should be remembered that the strike was one of the "lightning" variety, and that it only lasted a couple of days over a week. The public, therefore, had not time to realise that aerial services were running, and moreover the cost of carriage, viz., 2s. per ounce, was prohibitive except in the case of really urgent business correspondence. Therefore, the mail bags were in most instances very much on the light side. On one morning, for example, a machine left Hounslow for Bristol with 1 lb. 11 oz. of mail! On the other hand, the Brussels air mail went out with 1,400 lbs. and returned with 2,000 lbs. Obviously, then, the question of popularity is for the moment one of public knowledge that aerial mail services are running. It is largely a matter of use and custom.

Where it is known that services are in operation the public is not slow to take advantage of them, but in the matter of the strike services it was impossible to make the facts generally known in the time, and hence they were not very largely used. To blame the Post Office does not seem altogether logical. But after all excuses and explanations are made, it remains quite clear that when next, if ever, there is a stoppage of transport services the Post Office must be thoroughly prepared with plans for the carriage of mails by air. By that time, too, it should be possible to have ascertained with some certainty the cost of such services. Two shillings an ounce seems to be an inordinately high rate for letter postage, and we have no doubt at all that, given the necessary confidence and support by the business community, letters should be carried by air for no more at the utmost than a fourth of the strike figure.

One heartening aspect of these services is that although, roughly, 50 machines were employed in the service there was only a single serious accident to be recorded, and every bag of mail matter was duly delivered. That is a good record, and will undoubtedly assist in creating that public confidence in the dependability of aerial transport which we have always insisted is the first requirement of success in aerial development. The success of the services is the best sort of propaganda possible. Doubtless

many business people were compelled to trust their urgent correspondence to aerial post somewhat in fear and trembling as to its fate—the movement is even yet too young to command universal trust. All these have seen that the aeroplane can and does deliver its freight safely, and in far less time than is taken by other means of transport. It is arguable that what these people have been compelled to do by necessity on this occasion they will do of freewill on the next. In other words, they have been converted to the reliability of the aerial service, which has thus made many friends in consequence of its demonstration during the strike. It is an ill wind that blows no one good, and at least the ill-conceived strike of the railwaymen has done aerial development no harm.

The Freedom of the Press

One of the things that strikes us most in connection with the recent upheaval is the complete want of logic displayed by certain sections of Labour. They applaud to the echo the poisonous enunciations of such journals as the *Daily Herald*, and the more personally abusive its articles are of those who are striving to carry on the business of the nation the louder their applause. But let the "Capitalist Press" and the "reptile Press"—which seems to include every newspaper and journal but the *Herald* and a few more inconspicuous sheets—say a word against the chosen leaders of the workers, and they are up in arms in a moment. That would not matter much, if that were all. Everyone is entitled to the expression of his own opinion, so long as he does not try to prevent the other side in a controversy from having equal freedom of expression. Apparently, though, that is exactly what a section of Labour partisans do not intend to allow to those who happen to be on the other side of the fence. The letter addressed to Lord Northcliffe by the machine hands employed on the *Daily Mail* is a case in point. These men took exception to the tone of the leading articles on the strike, and expressed the intention of striking if the opinions were not modified. Lord Northcliffe took the only possible course in the circumstances by informing these men, through their leader, that sooner than have the policy of his paper dictated by anyone outside the editorial direction, he would close down altogether. That seems to have brought the men to their senses, since no action was taken, and the *Daily Mail* continues to be published as of yore. Not only the *Mail* encountered this trouble. Apparently there was something like an organised movement to stifle adverse comment on the strike, since in a number of other cases similar attempts were made to dictate policy, but these met with the fate that might have been expected if the men had stopped to think.

If there is one institution that must be more jealously guarded than another it is that of free speech and the untrammelled expression of opinion by responsible organs of public opinion. Once that freedom is lost, then good-bye to all the rest of the safeguards which make public life possible. If the men who last week tried to make trouble would stop to think, they would realise that the right of free speech is one which is subject to the greatest latitude—and quite rightly so. Indeed, strongly as we hold the latter view, we are sometimes inclined to wonder if speech is not too free in this England of ours. Some of the utterances to be heard in the parks



Captain P. D. ACLAND, Manager, Aviation Department, Vickers, Ltd.

"Flight" Copyright.

and on the commons are often so nearly verging on absolute sedition as to be indistinguishable from the real thing, and while such freedom is allowed it is surely illogical to endeavour to prevent the other side from being heard. However, there is no need to argue the point further. No attempt on the part of King, Government or proletariat can succeed in muzzling the Press, and for that the nation, including even those who made the ill-advised attempt to dictate to the papers what their strike policy should be, should be profoundly thankful.

• • •

A Useful Lead In another part of this issue of FLIGHT we publish a communication from Messrs. Beardmore, outlining their policy in the matter of aero engines of their manufacture. Briefly, they seem to have recognised that the shortest way to assist in the development of aerial enterprise is for them, as an individual firm, to prevent the very large number of aero-motors of their manufacture existing at the end of the War from being distributed broadcast and without responsibility. Therefore, they arranged with the Government to re-purchase every one of their engines and all the spare parts the Government were prepared to sell. As Messrs. Beardmore say, this transaction was concluded after a careful review of the trend of aeroplane engine design, the present high productive cost of manufacture, and the impossibility of continuing to manufacture any type in sufficiently large series to enable their being sold at a reasonable price for some considerable time. They contend with perfect justice that the enormous number of aero engines and parts on hand at the end of the War cannot adequately be made use of unless collected and dealt with in a manner which will ensure to the aeroplane manufacturers a power unit of proved merit, and equally important that standing behind it is an organisation of experience, possessed of ample resources, both material and financial, upon whom he can rely to render the necessary assistance as and when required.

We like the idea very much indeed, and congratulate Messrs. Beardmore on their foresight and readiness to adopt a policy which we are convinced is the right one. It is one that we should like to see adopted by every one of the great aero engine-building concerns in the country. Messrs. Beardmore are perfectly right in their premise that it is impossible at the present stage of development to lay down engines for manufacture in large enough series to arrive at cheap production. Nor is there a great deal of necessity for starting engine manufacture on the grand scale, inasmuch as

there are many thousands of engines, completed or nearly completed, awaiting disposal. Probably there are enough engines in the country to fill all our aerial needs for the next two years, or possibly even more. But, as again pointed out by Messrs. Beardmore, there is only the one way in which these almost numberless engines can be made of adequate service, and that is by their manufacturers standing behind them, as the Clydeside firm intends to do in the case of its own products. The example is one which we hope to see very widely followed. True, it entails the locking up of a considerable amount of money and the acceptance of a good deal of responsibility. That, however, only requires a little imagination and the same belief in the future of aviation as that shown by Messrs. Beardmore. Not only will such a policy prove to be for the general good of aviation, but it utilises resources which might otherwise be almost entirely wasted—and there is ultimately a substantial profit to be made. We commend the idea to other manufacturers.

• • •

The Citizen Guard

We greatly like the idea of the formation of the Citizen Guard, the purpose of which is to assist in the maintenance of order in times of emergency and to relieve troops and police of routine duty and free them for more important work. It is not only that it is the manifest duty of the good citizen to assist the forces of law and order, but it seems to us that in the Citizen Guard we have something more nearly approaching a real Middle Classes Union than anything we have had hitherto. Needless to say, the Guard will be recruited mainly from the middle classes, which are ever to the fore when there is work to be done or taxation to be paid. We can foresee that a spirit of comradeship and union will be fostered by the Guard, if only the authorities concerned will carry on strenuously with the idea, which will be of infinite use to the middle classes later on. There can be no blinking the fact that there is a real fight for bare existence before the middle classes. They are being ground between the upper millstone of the profiteer and the taxgatherer and the nether stone of inordinate wages demands by Labour, which have the effect of increasing the cost of living to an intolerable extent where the unfortunate person with a fixed pre-War income is concerned. Many attempts have been made to band the middle classes together for their own protection, but for some reason or other they have not met with conspicuous success. It is quite possible that an organisation like the Citizen Guard, which aims at the protection of the State and the Constitution, may achieve what others have failed in.

□ □ □ □

Disbandment of the W.R.A.F.

THE Air Ministry announces: An Order has been issued for the final disbandment of the Women's Royal Air Force, which has already been reduced to small proportions through rapid demobilisation during the past few months. The new Order, that demobilisation of the large majority of officers and other ranks, will be completed by November 8. A small number will be temporarily retained for the purpose of closing records, and winding up the affairs of the Force, and other special duties.

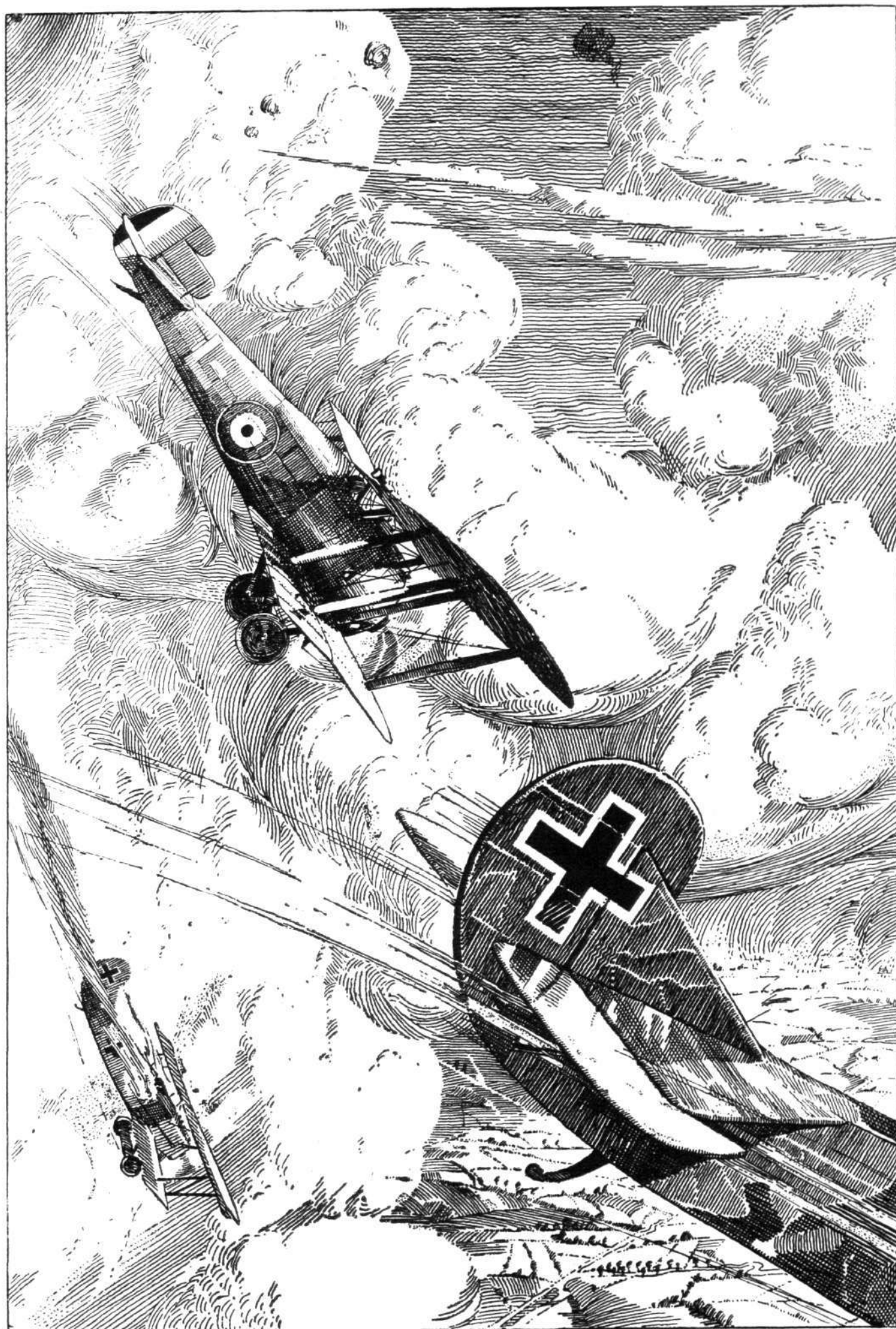
The Air Council has also issued the following special Order:—

"The Air Council desire to express their appreciation of the good work done by the Force both during and after the period of hostilities. In spite of much difficulty, and in face

of hostile and unjust criticism, the W.R.A.F. has left a record of which they can feel well proud. During hostilities the good work they accomplished went far towards enabling the R.A.F. to reach the dominating position in the air, which had such a direct influence in the achievement of the final victory.

"Subsequent to the Armistice, when it was necessary to disperse a large portion of the airmen to civil life, it was the W.R.A.F. who made it possible for the R.A.F. to meet the demands made upon it, and maintained the service at the aerodromes until new male personnel could be enrolled.

"The necessity for the demobilisation of the W.R.A.F. is now imperative, but in returning to civil life, Commandant Dame Helen Gwynne-Vaughan, D.B.E., officers and members may feel assured that they carry with them the good wishes of the Air Council and a debt of gratitude from the nation."



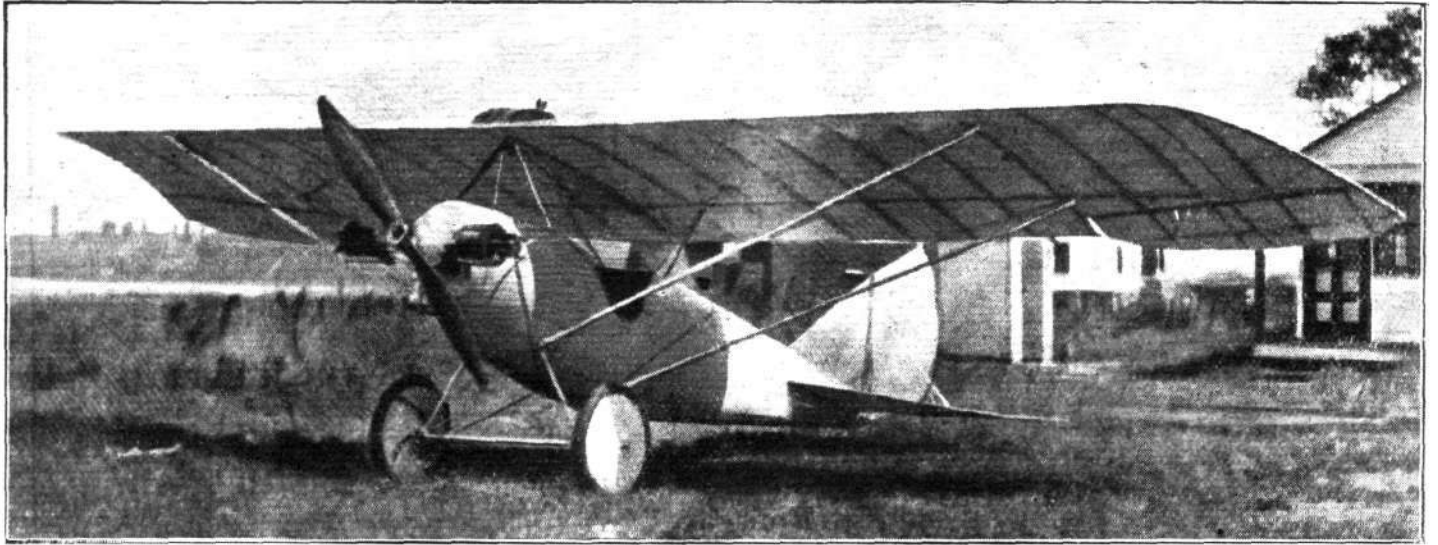
By J. McGilchrist.
"AND NOW FOR THE OTHER ONE": A Sopwith Snipe gets home on the Fokkers.

THE CATO SPORTING MONOPLANE

THIS single-seater machine was designed by Mr. Joseph L. Cato, of New York, primarily as a sporting monoplane, the objects in view being a very slow landing speed, quick getaway, and ease of control, together with inherent stability and good manoeuvrability both in the air and on the ground. With these objects in view, a wing of wide chord was adopted, and

10 minutes was obtained with this section, whilst the speed range obtained was 22 to 70 m.p.h.

Constructionally the Cato monoplane has received much thought and consideration for detail, and throughout the general design is the keynote of simplicity—by far the best method of attaining light weight, which is so desirable in a small sporting

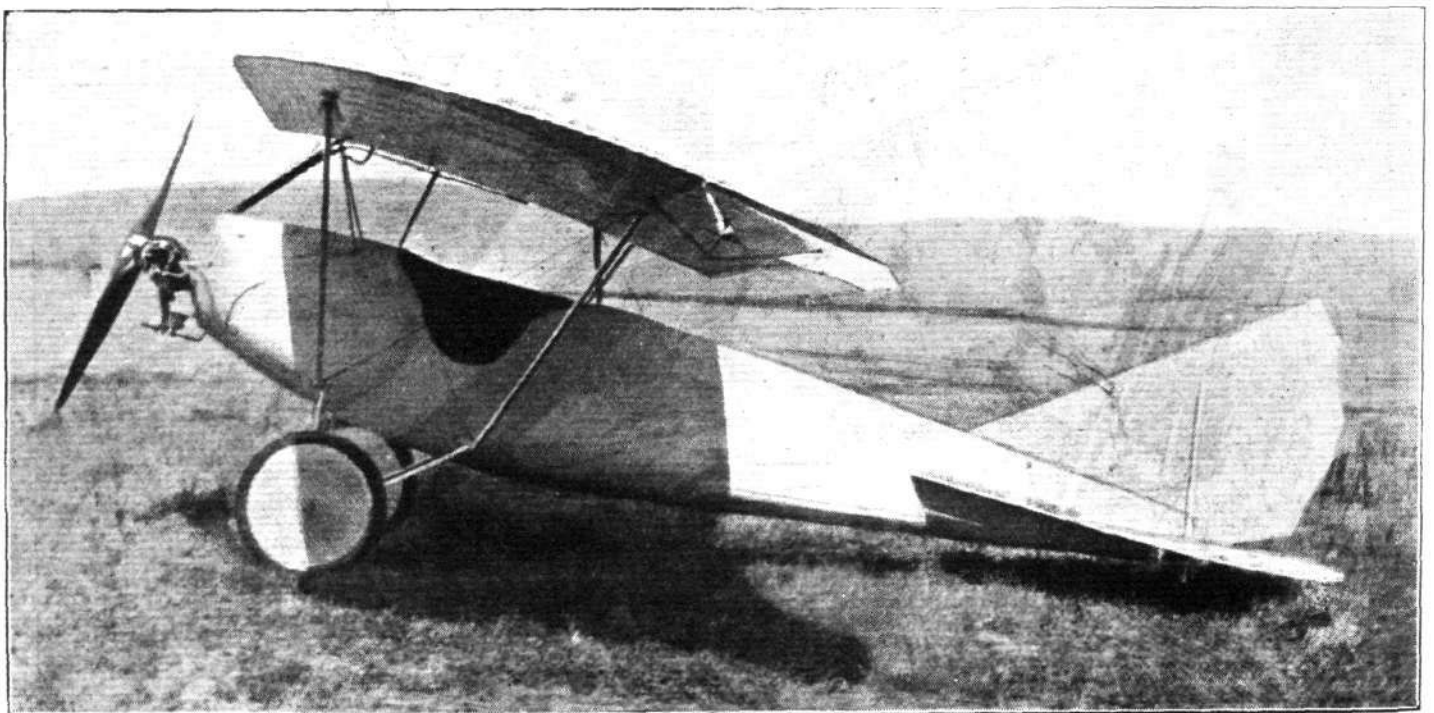


Three-quarter front view of the Cato sporting monoplane

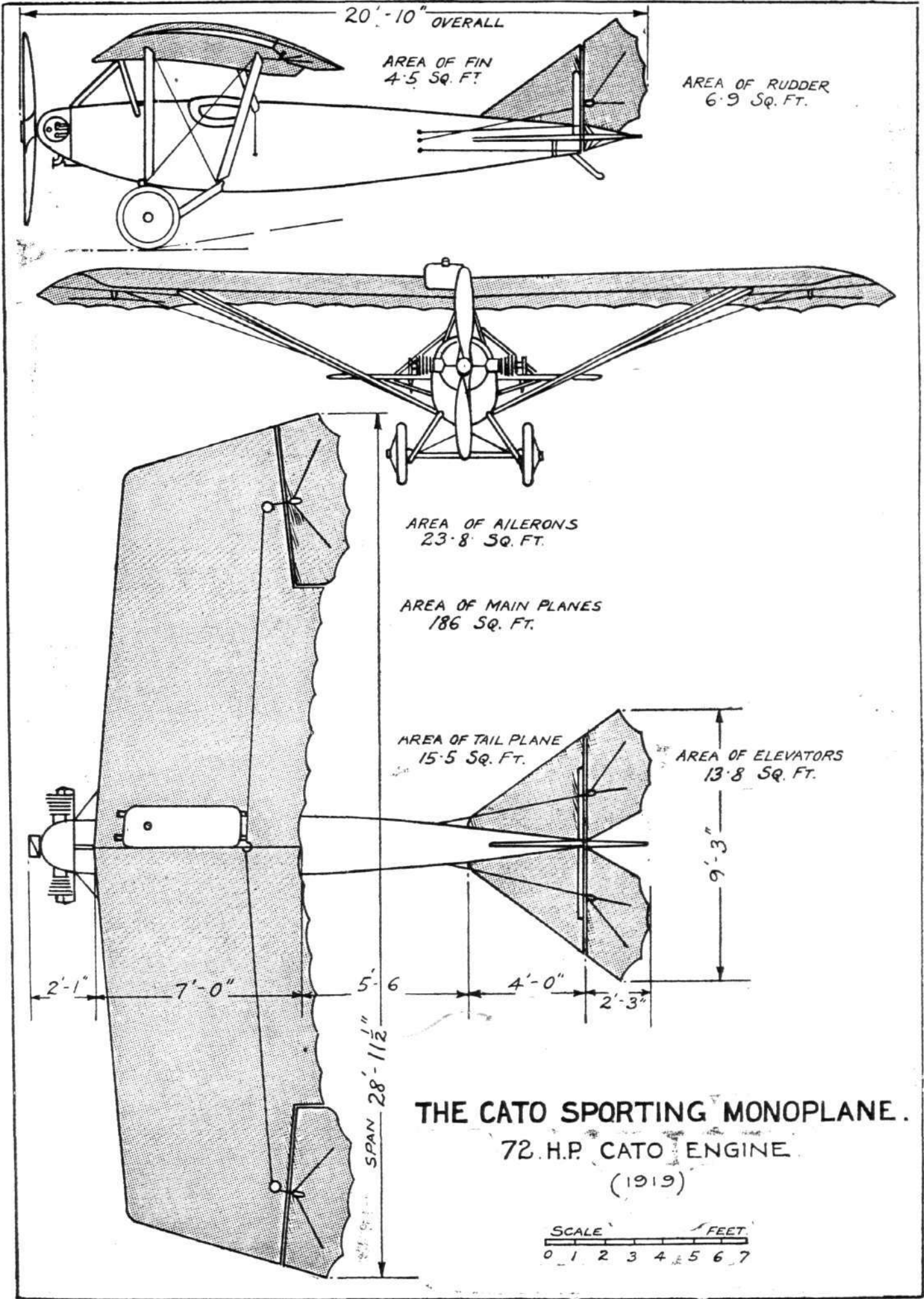
a special wing-section was laid out as existing sections were found to be unsuitable for the required performance.

This wing-section—known as Cato No. 4—which is shown with dimensions in one of the accompanying illustrations, was designed to give good climb and low landing speed rather than a very high speed, and recent tests have proved that it can accomplish all that was required of it. A climb of 4,600 ft. in

machine of this kind. Simplicity also makes for low cost of manufacture, which in turn brings the selling price within the reach of the average sportsman. The controllability of the Cato monoplane at low flying speed is exceptionally good, and on landing the machine comes to a dead stop within 45 ft., whilst to get away a run of no more than 50 ft. is necessary. The longest run made at highest landing speed was 120 ft. to a dead stop.



Side view of the Cato sporting monoplane



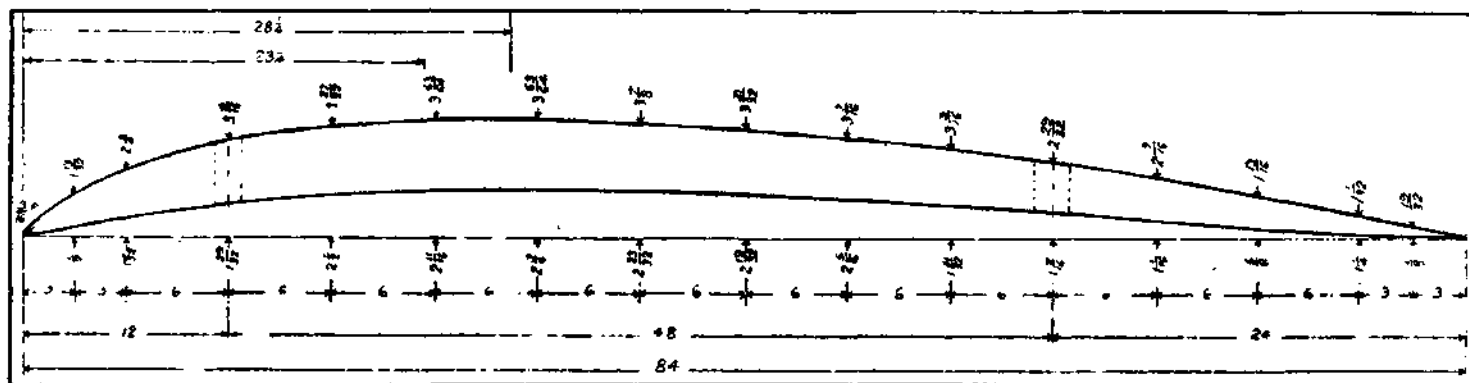
The CATO SPORTING MONOPLANE: Plan, side and front elevations to scale.

As will be seen from our illustrations, this machine is a monoplane of the parasol type. The *fuselage* is of good streamline shape, comparatively deep in section. It is of monocoque construction, built up of three layers of cedar, and weighs, as it comes off the mould, 58 lbs. A portion of the *fuselage*, on the port side of the cockpit, is cut away to give access to the latter, thus avoiding the necessity of the pilot climbing over the top of the *fuselage*, a considerable improvement on the hitherto awkward method of

changeable from right to left, and are further interchangeable with the rudder. The triangular fin is slightly offset to overcome the torque.

The landing chassis is of the V type, the Vs being of steel tube and interchangeable, whilst large-diameter wheels are fitted to provide easy rolling. The axle is sprung by means of the usual elastic cord. The tail skid consists of a three-leaf spring.

The power plant is a two-cylinder horizontally opposed air-cooled Cato aircraft engine, developing



Wing section of the Cato sporting monoplane

"embarkation." The bottom of the *fuselage* being 22 ins. from the ground, it is possible for the pilot to step into the cockpit as easily as one would step into a car. The pilot's seat is mounted 16 ins. from the floor of the *fuselage*. A wind screen is rendered unnecessary owing to the shape of the top of the *fuselage* at the rear of the engine.

A neat stick control is installed, and the rudder bar has three adjustments—short, medium and long. The throttle control is located on the starboard side of the cockpit.

The construction of the wings follows more or less standard practice. The wing spars are of I-section, and the wing-bracing strut attachments are held on by four bolts clamping the spar through maple blocks. The wings are built in two halves, and are braced by four main struts anchored at their lower ends to the sides of the *fuselage*. These main struts are interchangeable from right to left and from front to rear. The wings are mounted some 14 ins. above the *fuselage* on central *cabanes*, and are given a backsweep of 5° and a dihedral angle of 2°; the angle of incidence is 4°. The inner ends of the *aileron*s are set back at an angle of 4° in order to render them more effective at very low speeds. These *aileron*s are interchangeable.

The tail plane is of the divided type, of symmetrical section, and is permanently mounted some 6 ins. below the line of thrust. Each half of the tail plane is interchangeable. The elevators are also inter-

changeable from right to left, and are further interchangeable with the rudder. The triangular fin is slightly offset to overcome the torque.

The petrol tank is located on the root of the right wing, and has a capacity of 12 gallons, which is sufficient fuel for about three hours' endurance. The oil tank is also situated in this position. Both petrol and oil are supplied to the engine by gravity.

The general specifications of the Cato sporting monoplane are as follows:—

Overall span	28 ft. 11 1/2 ins.
Overall length	20 ft. 10 ins.
Chord	7 ft.
Sweepback	5°
Dihedral	2°
Angle of incidence	4°
Total area of main plane	186 sq. ft.
Area of <i>aileron</i> s	23.8 sq. ft.
Area of tail plane	15.5 sq. ft.
Area of fin	6.9 sq. ft.
Area of elevators	13.8 sq. ft.
Area of rudder	6.9 sq. ft.
Weight, empty	474.26 lbs.
Useful load	253 lbs.
Weight fully loaded	727.26 lbs.
Loading per sq. ft.	3.9
Loading per horse-power	10.1
Speed range	25-68 m.p.h.
Climb in 10 minutes	4,500 ft.
Ceiling	12,000 ft.
Endurance at high speed	3 hours.

Meteorology in the Empire

At the conference held in London recently Lieut.-Col. D. C. Bates (New Zealand) proposed "that the conference of representative meteorologists of the British Empire assembled together for the first time should agree to continue as an association for the exchange of views from time to time upon scientific matters concerning the achievements, requirements and organisation of their services." This was carried unanimously. Sir Napier Shaw was elected the first president; members were invited to submit rules for the guidance and acceptance of the Association.

The conference was beneficial in bringing together the

various meteorological organisations of the Empire, and it is confidently anticipated that as a result complete co-operation will be maintained between Dominions, Crown Colonies and the Mother Country. It is unnecessary to point out the need for this co-operation in view of the development of the great aerial routes of the Empire.

Air Services for China and Siam

LIEUT. E. C. RICON, who served in the French Army Air Service in China, is organising in America a scheme which aims at connecting up such points as Shanghai, Hong Kong, Hailung, Canton, Tonkin and Macao by aerial services for the conveyance of passengers and light freight.

The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

SPECIAL COMMITTEE MEETING

A SPECIAL MEETING of The Committee was held on Wednesday, October 1, 1919, when there were present Group-Capt. C. R. Samson, C.M.G., D.S.O., R.A.F., in the Chair, Mr. Ernest C. Bucknall, Lieut.-Col. F. K. McClean, Air-Commodore E. M. Maitland, C.M.G., D.S.O., R.A.F., Lieut.-Col. Alec Ogilvie and the Secretary.

Election of Members.—The following New Members were elected:—

The Hon. Mrs. Bethell.
Ronald William Carmichael.
Leo Austin Walsh.
Vivian Claud Walsh.

Schneider Trophy.—Mr. Priest, of Messrs. A. V. Roe and Co., attended before the Committee in support of the protest lodged by his Company against the elimination of the Roe Seaplane from the Schneider Race.

Royal Aero Club Seaplane Competition.—The report of the Technical and Competitions Committee was presented by Lieut.-Col. F. K. McClean.

On the motion of Lieut.-Col. Alec Ogilvie, seconded by Mr. Ernest C. Bucknall, it was unanimously resolved:—

"That on account of the Railway Strike, the Royal Aero Club Seaplane Competition proposed to be held at the end of October, 1919, be postponed."

HOUSE COMMITTEE

A Meeting of the House Committee was held on Monday, September 29, 1919, when there were present:—Mr. Ernest C. Bucknall, in the Chair, Mr. Herbert J. Corin, and the Secretary.

THE FLYING SERVICES FUND

A Meeting of the Flying Services Fund Committee was held on Friday, September 26, 1919, when there were present:—Group-Capt. C. R. Samson, C.M.G., D.S.O., R.A.F., in the Chair, Mr. Chester Fox, Squadron-Leader T. O'B. Hubbard, M.C., R.A.F., and the Secretary.

Grants and Allowances.—The following Grants and Allowances were made:—

(13) The School Fees of £3 15s. of the son of the father of a Lieutenant in the Royal Flying Corps killed on active service.

(105) An allowance of £2 a month for six months to the mother of a Cadet who died on active service.

(112) An allowance of £2 a month for six months to the widow of a 1st Class Air-Mechanic in the Royal Air Force killed on active service.

(129) An allowance of £4 a month for six months to the widow of a 2nd Class Air-Mechanic in the Royal Flying Corps killed on active service.

(141) An allowance of £4 a month for six months to the widow of a Private in the Royal Air Force who died on active service.

(145) An allowance of £4 a month for six months to the mother of a Private in the Royal Flying Corps killed on active service.

(148) An allowance of £1 a month for six months to the mother of a Private in the Royal Flying Corps who died on active service.

(153) An allowance of £2 a month for 12 months to the widow of a 2nd Class Air-Mechanic in the Royal Flying Corps killed on active service.

(161) An allowance of £2 a month for six months to the mother of a Private in the Royal Air Force who died on active service.

(164) An allowance of £4 a month for six months to the mother of a Private in the Royal Flying Corps who died on active service.

(172) An allowance of £2 a month for six months to the widow of a Private in the Royal Flying Corps killed on active service.

(178) A Grant of £10 to the widow of a Sergeant Mechanic in the Royal Flying Corps killed on active service.

(183) An allowance of £1 a month for six months to the mother of a 3rd Class Air-Mechanic in the Royal Flying Corps who died on active service.

(230) An allowance of £1 10s. a month for six months to the mother of a 3rd Class Air-Mechanic in the Royal Air Force killed on active service.

(231) An allowance of £2 a month for six months to the mother of a 2nd Class Air-Mechanic in the Royal Air Force killed on active service.

(251) The School Fees up to £50 per annum of the brother of an ex-Flight Sub-Lieutenant in the Royal Naval Air Service incapacitated on active service.

(253) An allowance of £4 a month for six months to the widow of a Private in the Royal Air Force who died on active service.

(258) An allowance of £3 a month for six months to the mother of a 1st Class Air-Mechanic in the Royal Air Force who died on active service.

(262) An allowance of £3 a month for six months to the mother of a Private in the Royal Air Force who died on active service.

(265) An allowance of £2 a month for three months to the mother of a 2nd Class Air-Mechanic in the Royal Flying Corps who died on active service.

(268) An allowance of £2 a month for three months to an ex-A.M.I. in the Royal Naval Air Service incapacitated on active service.

First Direct Non-Stop Transatlantic Flight

There has been a widespread expression of opinion that the first direct Transatlantic flight by Sir John Alcock and Sir Arthur Brown on a Vickers Vimy Rolls Biplane on June 14-15, 1919, should be permanently recorded in the Club House.

The idea has been fully considered by the Committee and they have decided to obtain portraits in oils, for hanging in the Club, of both Sir John Alcock and Sir Arthur Brown.

Sir John Lavery has very kindly consented to paint the portraits at a purely nominal figure, the canvases being 30 in. by 25 in.

A subscription list has been opened, and subscriptions limited to £1 is. are invited towards the cost.

Offices: THE ROYAL AERO CLUB,
3, CLIFFORD STREET, LONDON, W. 1.

H. E. PERRIN, Secretary.

London—Paris Air Express

THE Aircor express aeroplanes which fly daily between London and Paris completed on Saturday their sixth week of continuous operation. Since the service began, 86 flights have been scheduled, and of these, though on 28 days the weather was unfavourable, no fewer than 83 were accomplished. Only one flight had to be abandoned through weather, and on that day conditions were worse than they had been for years. The progress of another flight was interrupted by mist and exceptionally low clouds. Only once, during 20,750 miles flying, has a pilot alighted through mechanical trouble.

The Aerial Mail

ALTHOUGH the use of aeroplanes for aerial mails was only carried on for a few days, the authorities should have

garnered some valuable data which it may be hoped will serve a useful purpose later on. A start was made on October 1, when machines left London carrying mails for Bristol, Birmingham, Manchester, Newcastle and Glasgow, and 315 letters and packages were dispatched. The next day, the return mails were received in London.

Forty-six aeroplanes were used for the distribution of mails throughout the country. Mails were also carried to Paris and to Brussels for Denmark and Belgium.

Owing to the improvement in train services it was announced on October 6 that it had been decided to discontinue the inland civil aerial mail services. The services to Paris and Brussels continued to run successfully.

Fifty R.A.F. aeroplanes were employed on the distribution of mails on October 5.

RADIATOR POSITION

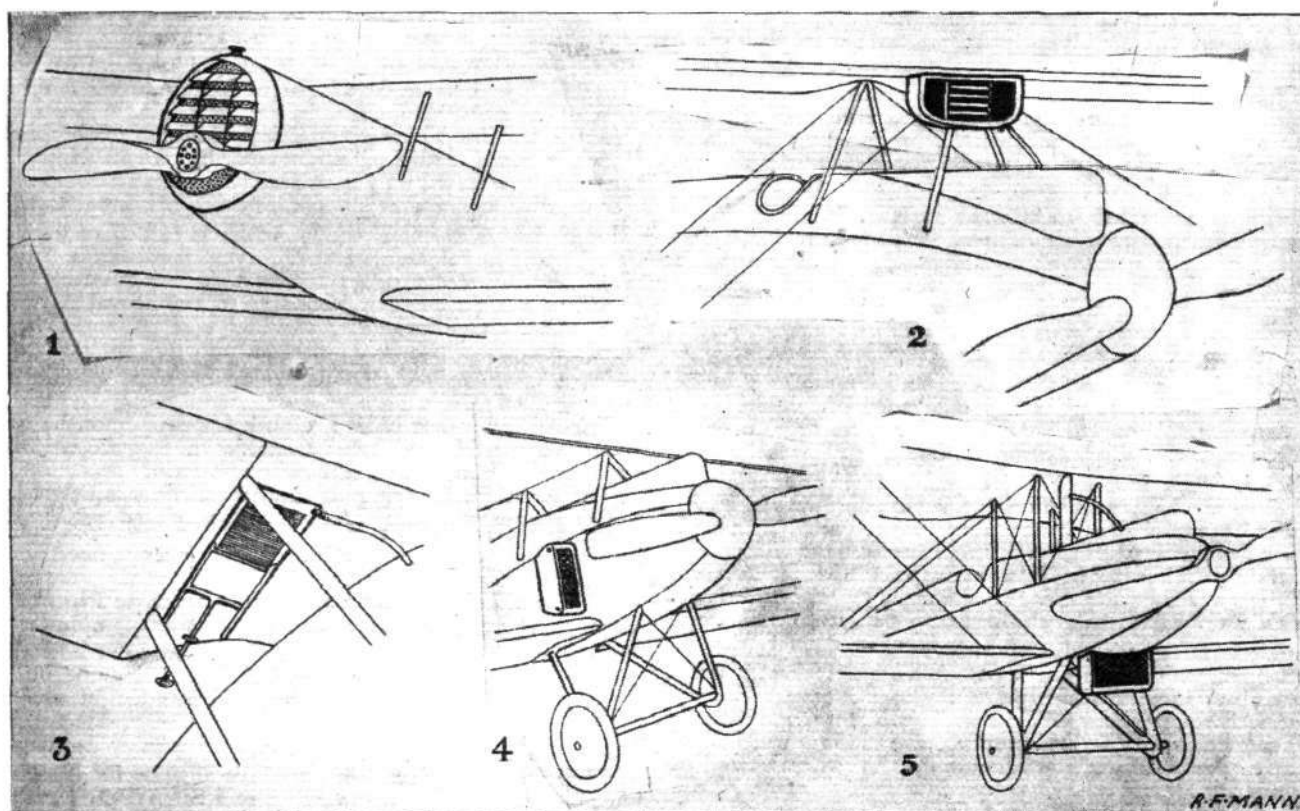
BY R. F. MANN

A CAREFUL consideration of the various methods employed by aeroplane designers in their efforts to solve any particular problem is not only of interest to the specialist, but also instructive to the uninitiated, for it enables the latter to realise how difficult it often is to arrive at a really satisfactory compromise. The problem of deciding upon the best all-round position for the radiator is one of particular interest, and as it has not received much attention in the pages of the technical press, the writer considers that no further introduction is necessary.

In the first place, the radiator, in addition to efficiently cooling the engine, must fulfil all, or most of, the following requirements, and as will be shown later, it is only possible to do this by choosing the position with great care. Requirement 1 is low weight; 2, small resistance; 3, its effective area must be capable of being varied by the pilot during flight; 4, be located as near the engine and the centres of gravity of the aeroplane as possible; 5, must not obstruct the view of the crew, or the range of fire of the guns; 6, must not interfere with the accessibility of the engine, magnetos,

during a "scrap." Another "low resistance position" is when the radiator is built-in flush with the centre section of the upper planes, but it will be shown later that this construction is not free from defects. Taking everything into consideration, it would appear that the best compromise is to employ a smaller radiator exposed to the strongest current of air, and modern practice is tending in this direction.

As regards 3, this provision is necessary because a radiator large enough to cool the engine efficiently on a warm day when flying slowly—at climbing speed, for instance—will overcool the engine when flying fast in a cold atmosphere, such as that experienced at 15,000 or 20,000 ft. By fitting a radiator large enough for the first set of conditions, it is possible to meet the second by one of three methods. The first method is to fit adjustable shutters, either in front of, or behind the radiator, which can be rotated by the pilot, and so cause the cooling surface to be screened the necessary amount. A modification of this method is to employ a blind mounted on a spring roller, which is controlled by a cable connected up with a hand wheel in the cockpit. It will be noticed that in



carburettors, etc.; and lastly, pilots naturally prefer radiators to be so placed that, in the event of one springing a bad leak, the boiling water does not stream down on to his face. Although the majority of such leaks during the past few years were attributable to hostile machine-gun bullets, it is not unknown for drain taps to shake loose, or pipe joints to unexpectedly spring a bad leak, for instance, during these days of Peace, so it is still necessary to remember this when designing purely commercial machines.

The first requirement can only be met—other things being equal—by keeping the radiator as small as possible, and to obtain the requisite cooling effect, it is essential for it to be exposed to the strongest current of air—which, in the case of tractor machines, is the slipstream from the airscrew. Unfortunately, this position is one of great resistance, and so does not comply with 2. If low resistance were the only requirement, the best arrangement would be to employ a very large area placed in a slow-moving current of air, such as, for instance, a radiator which formed the body covering from the nose to the pilot's cockpit. Quite apart from the objection of excessive weight, this construction makes the engine, tanks, etc., very inaccessible. Incidentally, the larger the radiator, the greater is the risk of its being hit

neither of these two methods does a reduction of cooling area reduce the air resistance, in fact it probably increases it slightly, so it will be appreciated that a very distinct advantage is obtained by making use of the third method, which is to mount the radiator between guides in such a manner as to allow it to be partially drawn into the fuselage, so reducing air resistance as well as cooling area. This method has been employed on the Zeppelin airships, as well as on the Airco De H. 9 aeroplanes. Unfortunately, this method cannot be satisfactorily employed for all the possible radiator positions, as will be shown later.

4. It is desirable to keep the radiator as close to the engine as possible in order to reduce the length of water-piping, and, consequently, the risk of broken or leaky joints. The closer it is situated to the centre of gravity—both in the horizontal and vertical planes—the smaller will be the moments of inertia, and the quicker will the machine respond to the controls.

5. The necessity for an unobstructed range of view rather narrows down the number of positions in which it is desirable to employ the third method of area variation outlined above. Obviously it is quite out of the question to place a radiator on the top of the fuselage, level with the pilot's normal line

of vision; so there only remain the two sides, or underneath the body. In the former case, it will be necessary to keep the width down to a minimum, if the view forward and downward is not to be unduly restricted. Also two smaller radiators, and their connections, are liable to give more trouble, and be less reliable, than a single large one; so by a process of elimination, one is forced to the conclusion that a position below the body in the case of a single-engine machine is the most satisfactory, if it is decided to use the third method of area variation. As regards 6, it has already been shown how one "low resistance" position does not satisfy this requirement.

Having given the reasons for the more important requirements, it will now be possible to examine the various positions in which radiators are placed on modern aeroplanes, and see how nearly these requirements are met in practice.

There are approximately half-a-dozen alternative positions, and they are:—(a) On the front of the fuselage—or engine nacelle in the case of multi-engine machines—between the engine and airscrew (see Fig. 1). (b) In the fuselage immediately behind the engine. (c) Mounted under the top plane to the front centre section struts (see Fig. 2). (d) Let in flush with the top plane; either directly over the body, or on either side (Fig. 3). (e) At the sides of the body (Fig. 4). (f) Underneath the body between the front chassis struts (Fig. 5). There are other positions, such as—on a "pusher"—in the nacelle in front of the engine, and in this case the flow of air is controlled by adjustable air scoops; but this example has not been included in the above for the reason that this type of aeroplane is now seldom designed.

The position shown in Fig. 1 is very popular with British designers, and a few typical examples are the Bristol F 2B, Airco D.H. 4, Martinsyde F 3 and 4, as well as the French Spad, and Italian S.I.A. and S.V.A. This position satisfies most of the requirements, and may be considered one of medium resistance, for although it is behind the airscrew, the slipstream is not as strong near the boss as it is nearer the tips. Being at the extreme nose of the fuselage, its weight increases somewhat the longitudinal moment of inertia, but this defect is probably of less moment than the fact that the large flat surface placed immediately behind the airscrew has an adverse effect on the efficiency of the latter; as was explained by the writer in a previous article. The fitting of adjustable shutters, or a blind, presents no difficulties, and the operating-gear need be quite short, and can be kept inside the fuselage. Although the radiator is quite close to the engine, its position does not seriously lessen the latter's accessibility. Water-piping can be kept short, with a reduction of the work imposed on the circulating pump, and chances of failure. Bearing in mind the fact that motor car radiators have, of recent years, been almost invariably placed directly in front of the engine, it is not surprising that this position should have been chosen by the early aeroplane designers when installing water-cooled engines in tractor machines. An alternative position is to place the radiator in the fuselage, immediately behind the engine, and as this has the advantage of massing a by no means unimportant weight nearer the centre of gravity, it was considered, a few years ago, to be a distinct improvement. Unfortunately it suffers from a great defect, which is that during a steep, prolonged dive there is a considerable risk of the engine cowling being forced away from its fastenings by the pressure of air inside the open front of the fuselage. This position is not now employed on any aeroplane with which the writer is acquainted, and as other positions offer as many advantages, and are free from serious defects, it is doubtful whether the type will be employed in the future. In the case of the "pusher" previously cited the pressure cannot become excessive, because the air has a convenient exit *via* the pilot's cockpit.

Fig. 2 illustrates a position which has, in the past, been very popular with German designers, and notable examples are found in the Rumpler and Aviatik biplanes. It is placed where the slipstream is strongest, and being above the water outlet of the engine cylinders, there is no need to incorporate a header tank in the circulating system. Although situated nearly over the centre of gravity, it is considerably above the line of thrust, and in this respect the position is not as good as it might be. The view of the pilot forward and upward is somewhat restricted, and can only be improved by mounting the radiator above the plane, which will increase the length of piping, and also its position above the centre of thrust. Also, in the event of damage causing a bad leak, there is every probability of the pilot being seriously inconvenienced by the scalding water. Although not an ideal position when used on single-engined tractor biplanes, it would appear to possess distinct advantages in the case of

multi-engined machines. Mounted, in this case, over the engines, on the struts leading to the upper plane, its position would neither restrict the view, nor would a serious leak inconvenience the crew. The water-piping would be quite short, and it would be easy to arrange for one radiator to serve both engines in the nacelle—in the case of four-engined machines. The radiator being quite clear of the nacelle, it would be possible to make the latter of a really good streamline form; and only the shape of the engine would prevent perfection being attained in this direction.

The examples given so far have been of medium or high resistance, but the position illustrated in Fig. 3 is one which offers the least possible resistance. This position has during the last year or two slowly, but surely, superseded C (see Fig. 2), and is now so extensively employed by German aeroplane designers, for single and two-seater machines, that it may be regarded as a typical feature of their design. The following are some noteworthy examples:—Albatross and Pfalz single-seaters, Hannoveraner, Halberstadt, and L.V.G. Type C VI in the two-seater class. This position is undoubtedly one of merit, for in addition to the prominent feature of low resistance, it will be seen that it is directly above the centre of gravity, although rather far above it in a vertical plane. Also the range of view and fire are not restricted in the slightest degree. This position of the radiator places it within such easy reach of the pilot, that very simple methods of area variation are quite practicable. One such system is to mount a sheet of aluminium between guides on the lower side of the radiator, and a small handle attached to the end of this shutter enables the pilot to slide it forward the necessary amount when wishing to decrease the cooling area. If the upper plane is quite close to the top of the body, and also staggered well forward, the radiator is brought quite close to the engine, and the length of water-piping is, consequently, not excessive. The foregoing are the chief points in favour of this position, so we will now turn our attention to the defects; and the foremost among these is that increase in size increases weight and the risk of damage during a "scrap." When this position is employed, the radiator is usually placed on the extreme right or left of the centre section, in order to minimise as much as possible the risk of scalding the crew in the event of a serious leak. Balance is maintained by placing a petrol service tank in the corresponding position the other side. It would appear that this position is suitable for really fast machines, where the slight increase of weight is amply justified by the reduction of resistance.

The position shown in Fig. 4 has sufficient merit to justify its being used in special cases, but it has never become as popular as positions A and D, for instance. The chief objection is that by using two radiators—one on either side of the fuselage—the installation is unnecessarily complicated; and, moreover, a header tank is essential, because the tops of the radiators are below the level of the outlets of the cylinders' water-jackets. This latter objection can be overcome by continuing the radiators up to the top plane, but as this somewhat restricts the range of view, the best compromise is to make use of the header tank. If the pilot is placed well back towards the rear, his view forwards and downwards is almost unaffected by the projections on either side. One advantage of this position is that the radiators are quite close to the centre of gravity and centre of thrust. Also, the slipstream is much greater than it is in the case of position A. Area variation, by means of shutters or blinds, presents no difficulties. Whilst on this subject it may be of interest to refer to a little-known experimental British machine in which the leading edge of a long radiator on either side was hinged to the sides of the body, and by moving the rear edge further away from the body sides, the cooling area could be increased to almost any extent; the maximum effect being reached when the radiators were placed at right angles to the body. If it should ever have been necessary to fly the machine with them in this position, the range of view would have been reduced to a serious extent.

The position illustrated in Fig. 5 possesses a greater number of advantages than it would appear, on first thoughts, to offer. The view is not restricted in the least; the slipstream here is almost at its maximum; the radiator is close to the engine, centre of gravity and centre of thrust; also, all the water can leak away without the crew running the slightest risk of being scalded. This is the only position, in the case of single-engine tractor machines, where it is convenient to make use of the third method of area variation, and it would seem that the excellence of this system more than justifies the slight complication involved. It might be argued that with the radiator in this position it is liable to be seriously damaged in the event of an undercarriage failure, and on first

thoughts this certainly appears to be the case, but it must be remembered that there are machines in existence in which the fuselage is mounted between the two planes, so with the radiator placed between the fuselage and the lower plane, the latter would bear the brunt of the shock. The position below the fuselage—and, consequently, the engine cylinders—necessitates a header tank being incorporated in the circulation system, but, as it has already been shown, this addition is unnecessary if the top of the radiator is sufficiently above the level of the outlets of the cylinders' water-jackets. This can only be obtained by mounting the radiator above the body, and unfortunately this position is not feasible in the case of single-engine tractor machines, because of the limits it would impose in the range of view, but when mounted

above the engine nacelles of multi-engined machines and used in conjunction with the third method of area variation, it would constitute an almost ideal system for this type of aeroplane. It would possess all the advantages of position C when used on multi-engined machines, together with that of being able to obtain both a reduction of resistance and cooling area by partially withdrawing the radiator into the nacelle.

In this, as in so many other matters, it is impossible to state definitely which is the all-round best, for that which may be very satisfactory with one set of conditions, is often quite unsuitable with another, so it is only possible to carefully explain the why and wherefore in the hope that some of the problems which confront aeroplane designers may be more generally appreciated.



"Flight" Copyright

THE RAILWAY HOLD-UP AND MAILS BY AEROPLANE : Post Office officials and the despatch and receipt of mails at Hounslow. 1. The Handley Page had a busy time. Two, fully loaded with passengers, set out for Paris. Our snap shows various members of the American Express Co. about to go aboard. Later a mail 'plane, loaded with 2,185 lbs. of mail, 250 lbs. of baggage, pilot and the mechanic, left for Brussels. 2. The above Kangaroo from Grahame-White brought in mails from Leeds. Another Kangaroo of the North Sea Aviation Co. carried mails to Leeds. 3. The D.H. 10 (Capt. Gathergood) flew with mails to Glasgow as its destination. 4. A "B.A.T." arrived from Manchester in 1½ hours, piloted by Turner. Another carried mails to Newcastle, piloted by Duke. 5. Capt. Gathergood, on a D.H. 10, sets out for Glasgow.

THE CATO 72 H.P. AERO ENGINE

This engine was designed by Mr. Joseph L. Cato, of New York, especially for the Cato sporting monoplane described in *FLIGHT* this week. In the design laid down, all experimental and untried features were eliminated, and only features which had been proven out by the designer's long experience were used, and the extreme importance of interchangeability was kept in mind. Light weight was secured by simplifying design rather than building light parts, and the very best material and workmanship employed with a view to extreme reliability and durability.

This engine is a two cylinder, horizontally opposed, four-cycle air-cooled valve-in-head type. Bore, 5 ins.; stroke, 6 ins.; piston displacement, 235.63 cub. ins.; compression ratio, 4.33 to 1; weight complete ready to run, 134 lbs., corresponding to a specific weight of about 1.86 lbs. per h.p. The rated horse-power is 72 at 1,825 r.p.m.

The crank-case is a two-piece aluminium alloy casting, split vertically and securely bolted together by standard S.A.E. $\frac{3}{8}$ -in. bolts. The engine is bolted to the fuselage by eight $\frac{3}{8}$ -in. bolts set at a large pitch diameter at the rear of the crank-case. The interior of the crank-case is well flanged to allow cooling, and as well gives an extremely rigid construction combined with light weight. The rear of the crank-case forms the gear-case housing. The gear-case cover, magneto bracket and oil pump plunger barrels are cast integrally.

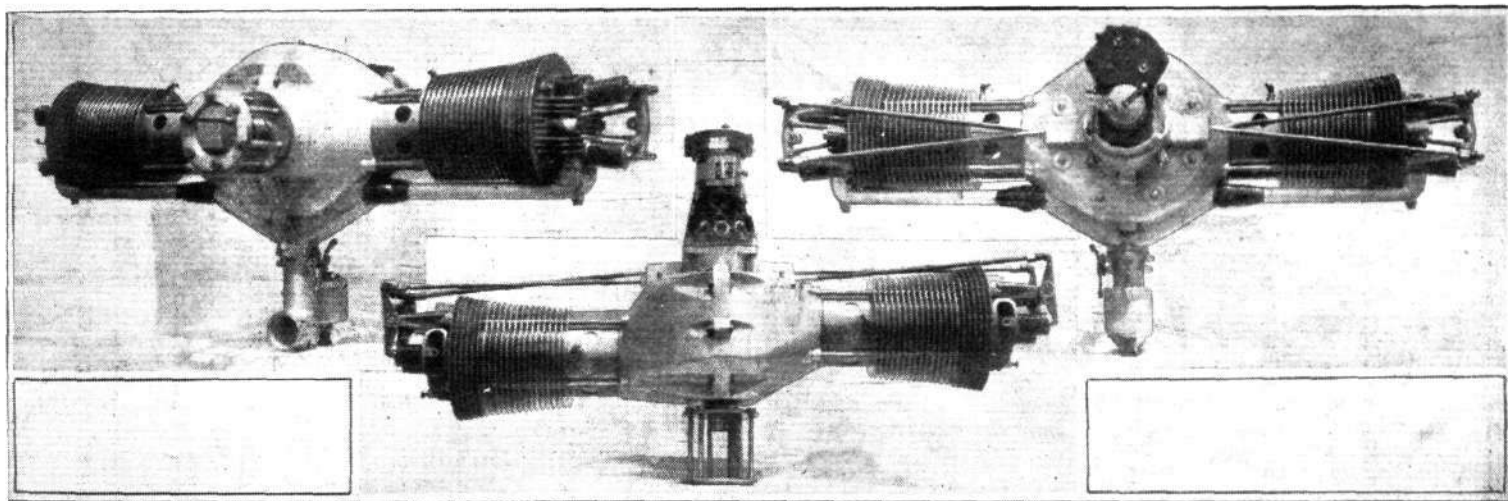
The actuating mechanism consists of one camshaft with two cams, one inlet cam and one exhaust cam, operating four tappets each connected to its valve push rod. The tappet rollers are ball-bearing. The camshaft is mounted on the outside race of a ball-bearing; the inside race is mounted on

front bearing and the two crank-pin or connecting-rod roller bearing races are machined on the crankshaft. The front flange for the propeller is machined integrally with the crankshaft. This shaft is of liberal size— $2\frac{3}{4}$ ins. in diameter—bored hollow throughout to insure minimum weight with maximum strength.

The connecting-rods are of one-piece construction, machined from a solid steel forging, and are of the "H" section. No bronze bushing is provided for the piston-pin end, but these are fitted roller bearings. The outside race is formed by the connecting-rod, while the inside race is the piston-pin. The big end or crank-pin end is solid with the outside roller race machined in the rod. This construction makes a short "H" section, which is unusually light, and consequently strong.

The pistons are cast of aluminium alloy fitted with one inland ring above the piston-pin. The piston-pin is free to oscillate directly in the piston-pin bosses and has bronze buttons at each end to prevent wear on cylinder-wall. The crown head is strengthened by eight webs radiating from a central boss in the piston crown. The formation of these webs is such that they act as cooling fins for the air circulating through piston at every stroke to carry heat off from the piston crown. Between these cooling fins, and equally spaced, air circulating ports are drilled. The piston-pin, on which the rollers of the small end of connecting-rod run directly, is bored hollow, hardened and ground. These pistons are of very light weight, which is of great importance to minimise vibration.

Two poppet valves are located in each cylinder head,



Three views of the Cato 72 h.p. aero engine

the crankshaft, and the camshaft is free to rotate on this ball-bearing. The camshaft or cam hub and gear are in one piece cut from a solid steel forging. The cam hub is driven at half crankshaft speed by internal gearing. Three idlers or planet pinions are used mounted on ball-bearings. The driving pinion on the crankshaft drives the planet pinions as well as the pump reduction gears. The valve push rods are of the tubular type with adjustment on one end. The valve rocker levers are mounted on ball-bearings with the outside race cut in the rocker lever and the inside race cut in the rocker lever-pin.

The cylinders are machined from solid steel forgings weighing 186 lbs. before, and 11 $\frac{3}{4}$ lbs. after machining. Fifteen cooling-fins are machined on the outside of the barrel. A little below the lower cooling fin, eight holes are drilled, equally spaced, to allow air circulation to piston head.

The cylinder-head is a grey iron casting with six cooling fins cast around, and nine across the head. These cooling fins allow ample cooling surface over the entire head, and hot valve, so common in air-cooled engines, is, therefore, entirely eliminated. Two spark plug bosses are provided, one on each side of the cylinder head between the valves. The cylinder head and cylinder are bolted to crank-case by means of long studs running the length of the cylinder and cylinder head. This brings the parts under compression, which is much more to be preferred than tension.

The crankshaft is machined from a solid steel forging. It is of the double-throw type with crank-pins set at 180° and mounted on two ball-bearings. The inside race of the

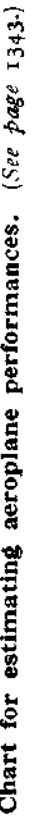
and all valves are interchangeable. The valves are $2\frac{3}{4}$ ins. in diameter. Excepting that the valve stem is somewhat shorter, the valve assembly is interchangeable with that of the Liberty engine.

The oiling system is of the dry sump, non-circulating type. Oil pressure is provided by a dual plunger-pump drawing oil from a supply tank in the fuselage, and delivering a small quantity to each of the cylinders every seven and a half revolutions of the crankshaft. On the down stroke of the plungers a small quantity of oil is delivered into the gear-case lubricating the oil pump reduction gears and the valve operating mechanism. The main bearings, crank-pin and piston-pin bearings are lubricated from oil spray in the crank-case.

The ignition is accomplished by a Bosch magneto mounted directly opposite the rear end of the crankshaft, and is driven from the end of the crankshaft at the same speed.

Carburation is secured through one special Zenith carburettor, and is bolted directly to the crank-case, in which the intake manifold is cast. The manifold from crank-case to the cylinder-head is located quite close to the cylinder, which is kept warm by the cylinder heat. The carburettor being bolted to the crank-case, not only makes a very rigid mounting, but adds materially to the cooling of the crank-case as well as warming the gas.

The overall dimensions are: Width, 46 $\frac{1}{8}$ ins.; length, 23 $\frac{1}{8}$ ins.; height, 20 $\frac{1}{4}$ ins. The petrol consumption at 1,650 r.p.m. is 86 lbs., and the oil consumption 2 lbs. per hour.



PREDICTION OF AEROPLANE PERFORMANCE*

By I. M. LADDON, Aeronautical Engineer, U.S. Air Service

THE following method of estimating aeroplane performance was outlined to the author by Lieut. Alkan of the French Aviation Mission. It consists in comparing the aeroplane whose performance is to be found with the actual performance of an aeroplane of similar type on a power and a surface loading basis.

The actual performances of three different types of aeroplanes are given on the chart on p. 1342. These aeroplanes are all good, clean designs; therefore, when comparing an aeroplane that is poor aerodynamically with any one of the above, an allowance should be made in the high speed obtained. In extreme cases this allowance may run as high as 10 m.p.h., but for all ordinary designs no allowance need be made. The ceiling is not correspondingly affected. Curves of actual performance shown include the three common types: (a) Single-place scout. (b) Two-place fighter or reconnaissance aeroplane. (c) Three or four-place, twin-engined bomber. By selecting the proper type for comparison one can make an accurate prediction.

It has been the author's experience that the results obtained through this simple method are much more reliable than those given by the old laborious method of computing the parasite resistance, horsepower required, available, etc. It should prove quite useful to the designer, since it affords a rapid and accurate means of estimating how changes in weight, surface

* From *Aviation*, U.S.A.

or horsepower affect the performance of the plane in question.

Example—Twin-engined aeroplane: weight, 7,200 lb.; horse-power, 800; surface, 900 sq. ft.

The obvious plane to use for comparison is the twin-engined bomber.

1. Find the intersection on reference line B of a straight line through the propeller efficiency and horse-power.

2. Join this point to the surface and note the intersection on line V.

3. Find the intersection on reference line C of a straight line through weight and surface.

4. Join point on reference line C to point on reference line B, and note intersection on line A.

The linear difference between the points found on lines A and V and the corresponding points given for the plane which it is being compared with are the measures of the relative ceiling and speed.

5. Construct a curve similar to curve C, using ordinates increased (or decreased) by the difference in altitude (C-K) and abscissæ increased (or decreased) by the difference in speed (C-K).

6. From the point of absolute ceiling (E) draw curve parallel to curve D.

This curve gives the minimum speed for horizontal flight at given altitudes, while the curve first constructed gives the high speed. The enclosed area is the speed range.

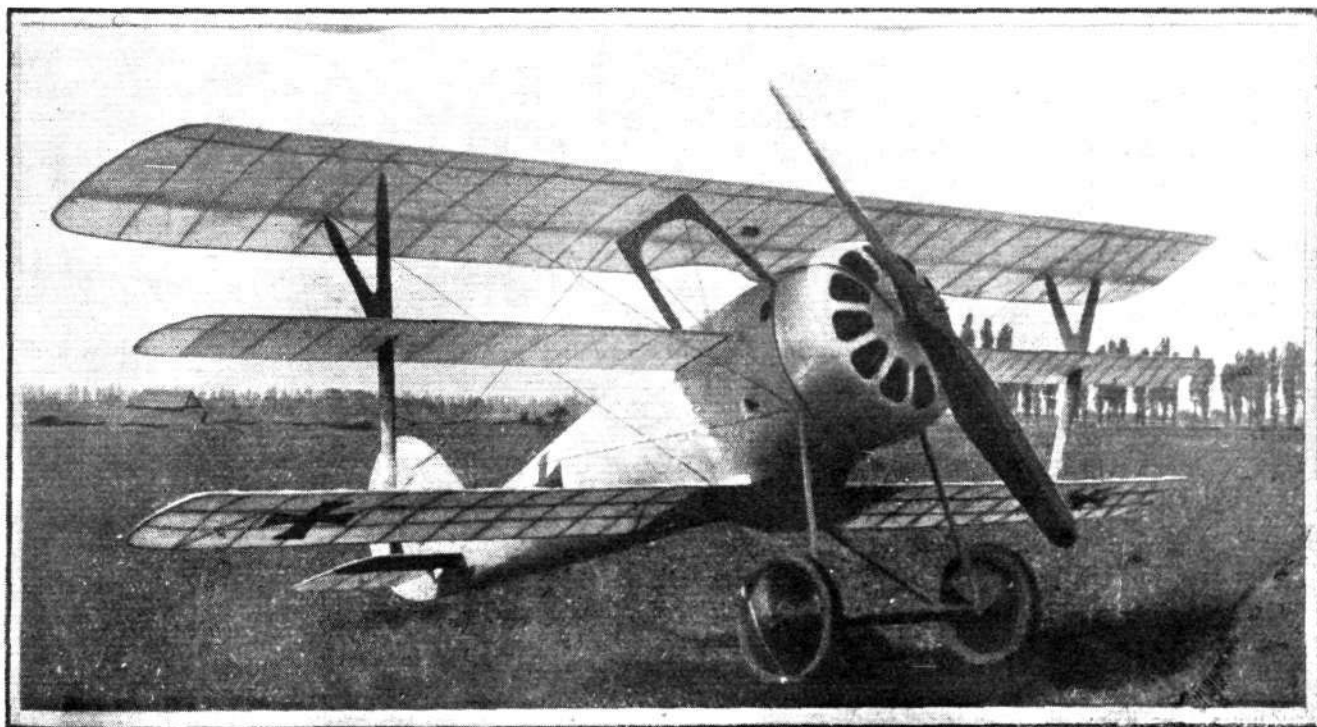
Searchlights for Aerodromes

THE Air Ministry announces that as a temporary and emergency measure to assist belated aircraft to locate their aerodromes after dusk, the Air Ministry has arranged for vertical searchlight beams to be projected from the following aerodromes about dusk till all overdue machines have arrived:—

Hounslow ..	1 vertical beam.
Kenley ..	2 vertical beams.
Lympne ..	3 beams, arranged in a triangle.

U.S. Warships to Carry Seaplanes

ANNOUNCEMENT was made by the U.S. Navy Department on September 13 that every American warship of the second class is to have a seaplane included in its equipment. It is stated that the U.S. naval authorities are convinced that the time has passed when a direct attack on sea coast cities may be made by a battleship fleet however powerful; the attack will be by seaplanes launched from a moving base of dreadnoughts at sea.



The Pfalz triplane, fitted with rotary engine.

THE BEARDMORE AERO ENGINES AND COMMERCIAL AVIATION

PROBABLY no other single item will play such an important part in deciding the future of aviation as a commercial proposition as will the aviation engine. Aeroplane constructors are to a large extent dependent on the engine manufacturer, not only as regards the type of his machine, but also in the matter of the price at which this machine can be sold to the public. It is obvious to anyone acquainted with the aviation industry that for several years to come commercial aviation will not be on a scale which will allow production in anything like the quantities which were demanded during the War. This will mean that the saving in labour and cost which attends production in large quantities will not be available, and consequently the cost of production—and, therefore, the sale price—will be comparatively high. The problem is one which has to be faced, and as the question of cost will play an important part in the immediate future of commercial aviation, anything which tends to bring the price of aircraft down is to be welcomed as assisting in making the immediate prospects of commercial aviation more encouraging. A step in the right direction in this respect is, we think, the purchase from the Government, by Messrs. The Beardmore Aero Engine, Ltd., of all the Beardmore aero engines which the Government were willing to sell. By this transaction it is hoped that it will be possible to sell the Beardmore engines at a reasonable figure, while at the same time providing an adequate supply of spare parts in order to ensure prompt and correct replacements of parts damaged as the result of accidents or worn out by ordinary wear and tear. The purchase referred to includes the whole of the Beardmore engines and spares, new and second-hand, partly or completely manufactured. Regarding the purchase of the Beardmore engines, and the plans for their future disposal, we have received from Messrs. The Beardmore Aero Engine, Ltd., the following communication:—

"A man's or firm's faith in an industry, or any section of same, is perhaps best demonstrated by the degree to which they are prepared to stake their money on it. Ours can be judged by the fact that immediately we learned that Beardmore aero engines were going to be disposed of through the Government we stepped in and purchased every engine and part they would agree to sell, and as this was a six-figure transaction, it may be safely assumed that we have faith both in our engine and the future of aviation.

"The above transaction was concluded after a careful review of the trend of aeroplane engine design developed during the War, the present high productive cost of manufacturing and the impossibility of continuing to manufacture any type in sufficiently large series to enable their being sold at a reasonable figure for some considerable time.

"The Beardmore engine was conceived and first constructed in 1908, and its present state has been one of gradual evolution. At that time the question of cost in relation to service had to be considered, and, in fact, was considered far more seriously than has been the case during the past four years. We were convinced that this must be quickly realised by all practical men who had an opportunity of observing the amount of service obtained from engines designed exclusively for War purposes in relation to their cost, and this, coupled with the influence that the War would have upon future production cost, decided us in embarking upon the policy mentioned.

"The number of Beardmore engines and parts of engines on hand represented an enormous volume, both in cash and potential value to commercial aviation, but this value could not be adequately made use of unless it was collected and dealt with in a manner that would ensure to the aeroplane manufacturer a power unit of proved merit, and equally important that standing behind it was an organisation of experience, resources, material and financial, upon whom they could rely to render the necessary assistance as and when required. We claim that our policy will go far to meet such needs, but as it is only intended to appeal to the actual aeroplane manufacturer and manufacturer's agent, we propose shortly to place it before them direct for their consideration.

"In addition, we have organised and equipped with the most modern appliances of all kinds an entirely independent factory to deal with the motors in the following manner:—

"Each engine, upon receipt, will be carefully examined by experts, and graded according to its condition and the classified record of its history. Any motor that has seen service in an aeroplane, no matter for how short a period, will be entirely dismantled, cleaned, and examined by a specially qualified and experienced staff of experts. Any parts found to show signs of wear, exceeding the tolerances allowed on new engines built to Government specification and subjected to A.I.D. inspection, will be replaced by new ones. The motor will then be rebuilt and subjected to the standard endurance, power and consumption tests.

"A certificate of performance will be issued with each engine upon leaving the factory, and, in addition, will be guaranteed by us as to material and workmanship for a period of six months.

"An adequate supply of spare parts will be always and immediately available for despatch on request, and local stocks will be provided in the various colonies and countries abroad where circumstances warrant."

The Airship Old Comrades' Association

THE office of the Airship Old Comrades' Association has been transferred to 147, Oxford Street, W.

Royal Aero Club Seaplane Competition

ON account of the railway strike the Committee of the Royal Aero Club, at its meeting on October 1, 1919, decided to postpone the Seaplane Competition proposed to be held at the end of this month.

Roll of Honour

THE War Office announces that the following officers who were previously reported missing are now reported killed: Lieut. A. J. C. E. Phillippo, R.A.S.C., attached R.F.C.; Sec. Lieut. R. G. Ottey, R.F.C.; Sec. Lieut. G. B. Samuels, Durham L.I., attached R.F.C.; Capt. A. H. Smith, M.C., R.F.C.

A.R.N.A.S.-R.N.V.R. Reunion

A REUNION is to be held in London on November 8 of R.N.V.R. and R.N.A.S. men who passed through the Crystal Palace during the War. Those interested are asked to send a postcard to Mr. E. B. Holmes, Hon. Secretary, C.O.I., Reunion Committee, 60, Fountayne Road, N. 16.

Petrol and Profiteering

THE Board of Trade have issued an Order declaring motor spirit "used or capable of being used for supplying motor power to motor vehicles" to be an "article in common use" under the terms of the Profiteering Act; and by another Order they have used the powers given them by that Act to fix maximum prices for such spirit. The maximum retail

prices are: Aviation, 3s. 2½d.; No. 1, 3s. 0½d.; No. 3, 2s. 10½d. per gallon in cans. In Ireland and Scotland 1d. per gallon more may be charged.

Testing the Lawson "Aerial Transport"

A CROSS country trip of 313 miles was made on September 13 by the Lawson "Aerial Transport," of which a description was given in FLIGHT of September 11. Leaving Syracuse at 8 a.m. the machine, piloted by Mr. A. W. Lawson and Mr. C. Cox, flew to New York and landed in the Mitchel Field at Mineola. Altogether there were nine persons on board including the two pilots, an engineer, two mechanics and four passengers.

French Ace Killed at Football

LIEUT.-PILOT NOGUES, who has just been demobilised after serving for the last five years in a chasing squadron at the front, and escaped from Germany after being made a prisoner of war, was killed on Sunday when playing Rugby football. In the course of a friendly match between the Racing Club and the Paris University Fifteen, Nogues, who was playing for the former, sustained injuries to his neck, and died during the evening. Lieut. Nogues had brought down 13 Germans, and wore the Croix de Guerre with 10 palms.

Italian Flying Boat at Stockholm

THE Savoia flying boat, piloted by Lieut. Count di Robilant, arrived at Stockholm on Saturday evening from Copenhagen. The journey from Texel (West Frisian Islands) to the Danish capital was made on September 30 in just under four hours.

THE OERTZ FLYING BOATS

[THERE is little doubt that the development of commercial aviation will be closely allied with the progress made in the production of seaplanes, especially as far as the British Empire is concerned. It is, therefore, of interest to know what has been done until now by others as well as by ourselves, and we think that the following notes, translated from *Flugsport*, dealing with an interesting series of flying boats designed and built by the Oertz Works at Hamburg, may be of interest. This factory was, before the War, chiefly concerned with the building of yachts and motor boats, corresponding, in a way, to our Saunders Works at Cowes.—ED.]

worthiness. By this is meant the possibility of getting off and alighting with a certain amount of sea running, and also to be able to 'live' when on the surface in rough weather. The performance required is in direct opposition to the qualities of seaworthiness, since a seaplane, to be seaworthy, must necessarily be of very substantial construction, which can only be provided at the cost of a fairly heavy weight of the hull and machine.

"Next, it would appear that the float seaplane would be superior to the boat seaplane in the matter of seaworthiness, since the boat has a very low free-board, and, therefore, will be more likely to be

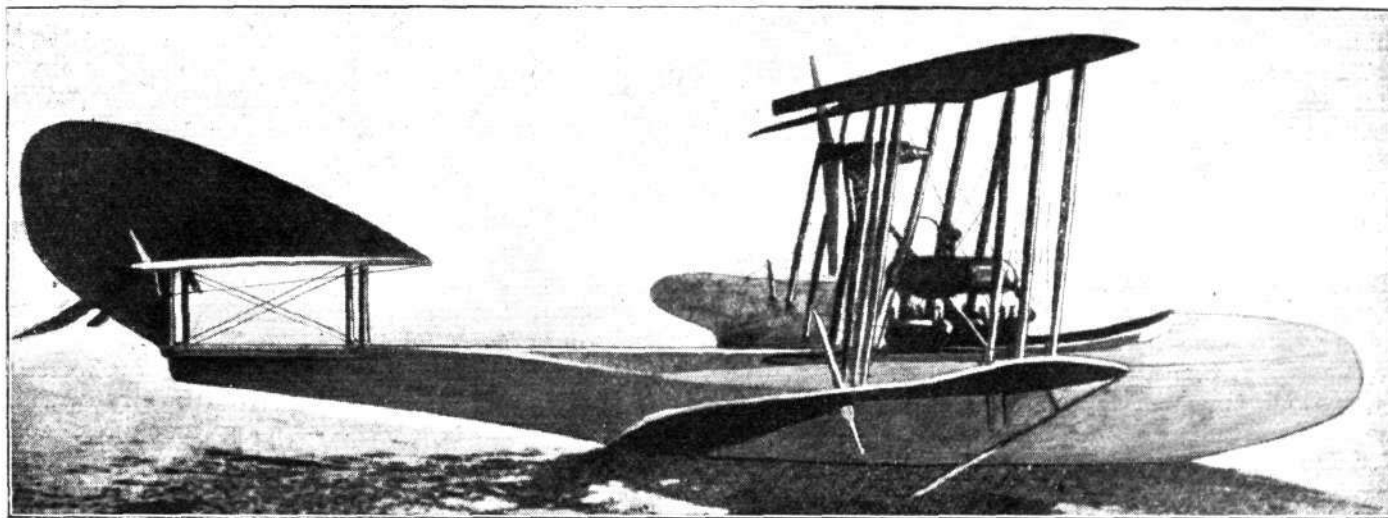


Fig. 1.—The first Oertz flying-boat of 1913. The engine was a 100 h.p. Argus

"The fight for existence between the flying boat and the float seaplane commenced in the very earliest days of seaplanes. Even now the final decision as to whether the flying boat or the float seaplane offers the best solution for aerial transport over the sea has not been made. The experience gained during the War cannot straightaway be applied to peace conditions. At the moment the flying-boat people naturally have the last word, since a flying boat was the first to cross the Atlantic safely. After the questions of weight and air-resistance, the most important point in the evaluation of the advantages and disadvantages of the two types is that of sea-

swamped while taxiing than will the float seaplane. Moreover, the lower plane of a boat seaplane is much nearer to the water than is that of a float seaplane, so that there is more likelihood of it coming in contact with the sea. It will, therefore, be seen that the difficulties that beset flying-boat constructors are by no means small.

"With regard to the questions of weight and air resistance, it must be said that the flying boat is more favourably placed in both respects. Although for powers of 150 to 240 h.p. the weight of the two types does not differ greatly, the advantages of the boat seaplane increase with size. Thus, a float sea-

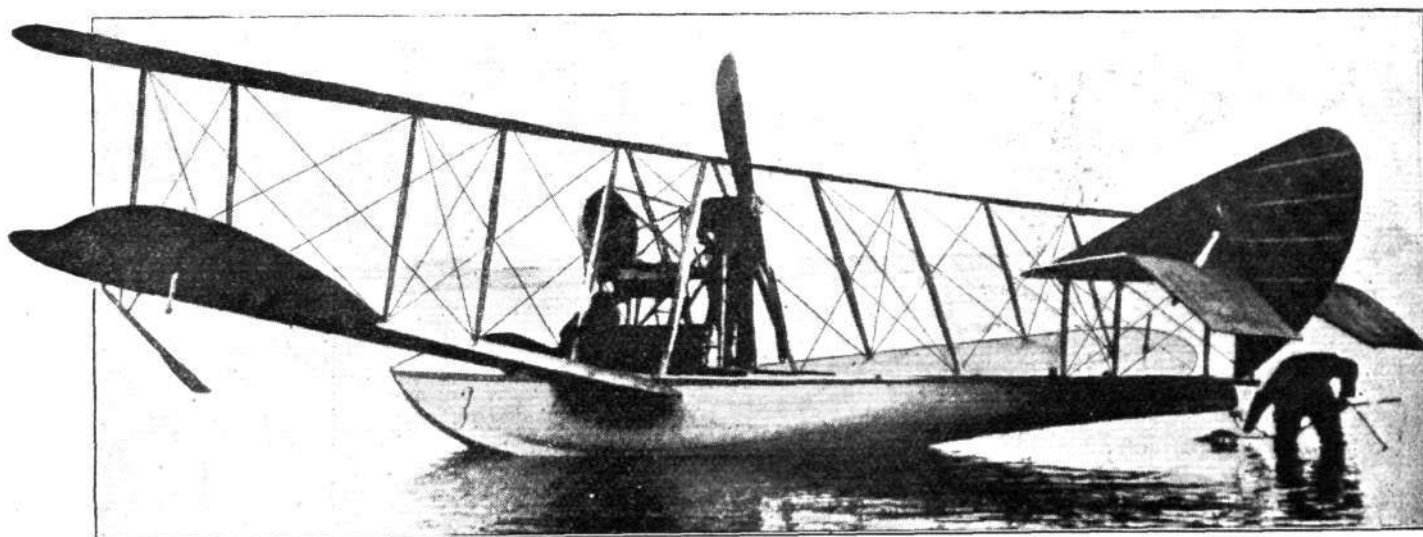


Fig. 2.—1914 type Oertz flying-boat, 160 h.p. Daimler engine

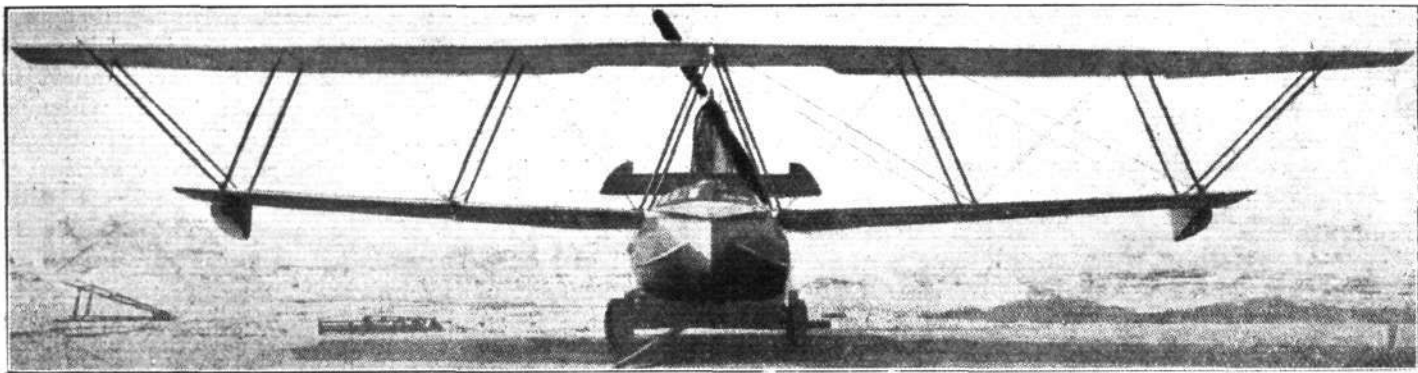


Fig. 3.—The 160 h.p. Oertz flying-boat of 1915

plane of 1,000 h.p. will be about 4,400 lbs. heavier than a boat seaplane of the same power.

"From the point of view of air resistance, the fact that a float seaplane has a fairly extensive strutting arrangement for the floats, while the boat seaplane can be made of fairly good stream-line shape, gives the boat type a smaller resistance than that of the float type, even when, as is sometimes the case, the engine of the boat seaplane is placed on a structure above the boat proper.

"After balancing up the pros and cons. of the case, taking into consideration the practical experience of the Navy, one arrives at the conclusion that the flying-boat type, as regards medium and large-size machines, is superior, also as regards seaworthiness. For types of up to about 300 h.p., possibly the float seaplane will be found the most suitable, while for types of from 300 h.p. to 700 h.p., there would seem to be little to choose. For larger types, however, the flying boat type appears to be the most promising. The chain of experience of both types is not, however, sufficiently long to make it advisable to decide finally for one type or the other.

"Among the most successful, and, therefore, most noteworthy, flying boats, are those designed by D. Ing.

Max Oertz, which were built at the Oertz Works at Hamburg. Dr. Oertz, the famous yacht and motor-boat builder, was one of the first in Germany to realise the possibilities of flying and the suitability of his works, with their special facilities and trained workmen specialists, for the requirements of aircraft construction. Above all, the Oertz Works were not laid out as quantity production works, but were used to meet the special requirements of yacht construction by scientific investigation into the smallest mechanical details, and to devote an absolutely loving care to workmanship and finish.

"These fundamental facts, which were reflected in all new productions of this scientifically working factory, whether boats or flying machines, could already be noticed in the very first machine built in 1910. This was a land machine, a monoplane with monocoque body, which weighed only 770 lbs., and, fitted with a 70 h.p. Gnome engine, reached a speed of 80 m.p.h. This first success encouraged Oertz to return to his proper element, the sea, and to apply the same principles to the construction of a flying boat; this was ordered by the Navy in the spring of 1913. Already in the autumn of the same year this flying boat could show its usefulness by

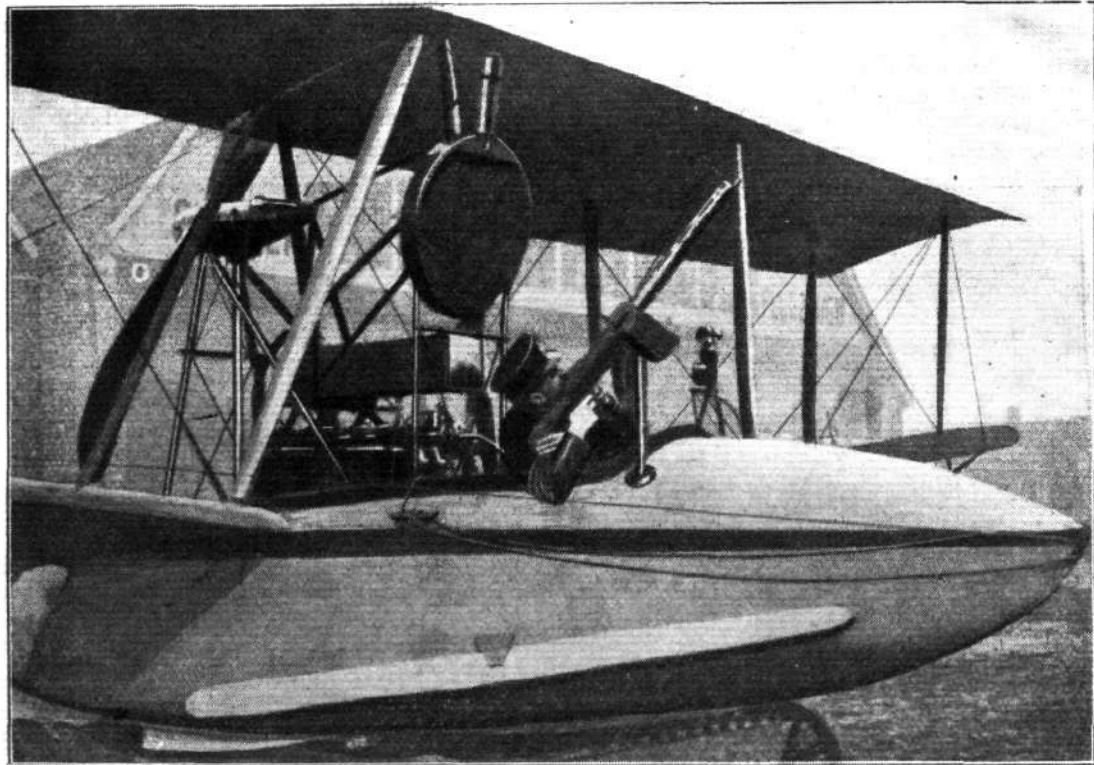


Fig. 4.—1915 type
 Oertz flying-
 boat, 160 h.p.
 engine

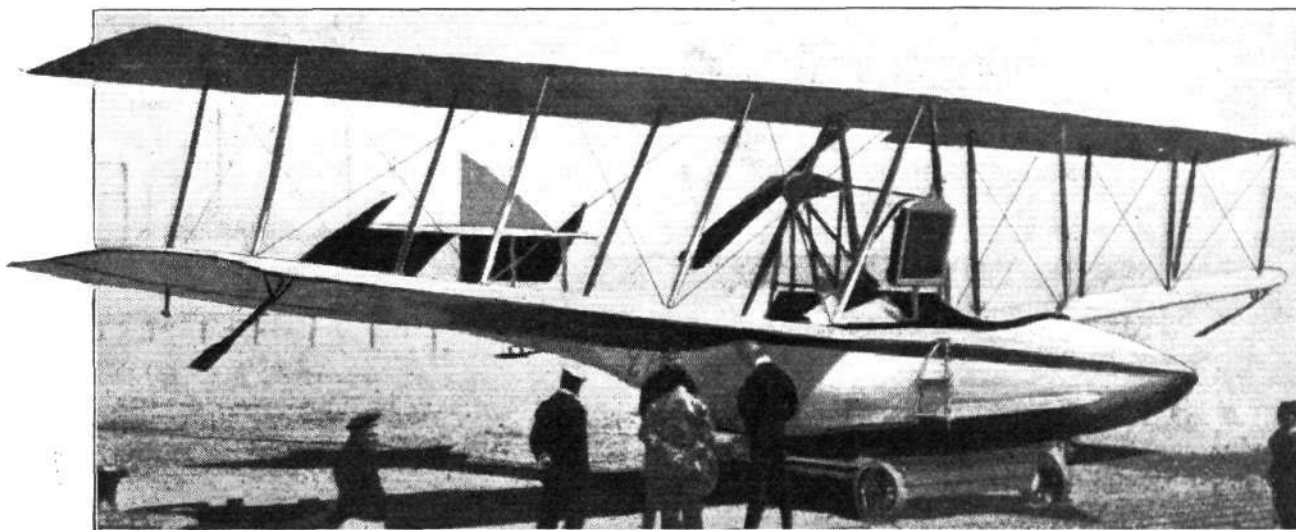


Fig. 5.—Oertz flying-boat of 1915, fitted with 240 h.p. Maybach engine. The machine was designed for a 260 h.p. Argus, but this could not be obtained

successful test flights at Breitling, near Warnemünde. This machine, which is shown in Fig. 2, was fitted with a 100 h.p. Argus engine placed down in the boat, and driving the airscrew through shafts and bevel gearing. This arrangement, the constructional details of which had been worked out by Dr. Oertz himself, was something quite new for those times, and this first boat already showed the characteristics of all later Oertz flying boats. Among these is, chiefly, the division of the planes into two halves and the slanting struts, with means for quickly dismantling the complete plane *cellule*. In looking at this flying boat, the thing which at once attracts notice is the very large chord of the lower plane, compared with that of the top wing. The object of this arrangement was to raise the centre of pressure of the biplane, and thus reduce the undesirable pendulum effect caused by having the engine in the hull. The objections to this effect have, however, later proved to be of small importance.

"One of the greatest difficulties of that time was to design a boat hull which should have the greatest possible amount of lateral stability when on the sea.

The French flying boats of that date had very narrow hulls, which necessitated fitting auxiliary floats to the lower wings. In anything of a sea, these wing floats were a constant danger to the plane, owing to the shocks and stresses set up. It was in this respect that the art of the experienced yacht builder came to the rescue. Oertz provided a boat hull, which not only had a very good stream-line form, but which also possessed a very great amount of lateral stability on the sea; so much so that it was possible for a man to walk half-way out on the lower plane without the machine heeling over enough for the plane to touch the sea. This great lateral stability on the sea has remained one of the features of all Oertz flying boats to this day. The credit of being the first to provide this lateral stability is not in the least reduced by the fact that the American Curtiss flying boat, which was used in the Transatlantic flight, shows the same feature. In order to reduce the danger of the lower wing tips cutting under when the machine is rolling in a sea or taking off, the lower wing tips were provided with flat spring boards which prevented, by their dynamic action, the tips from cutting under.

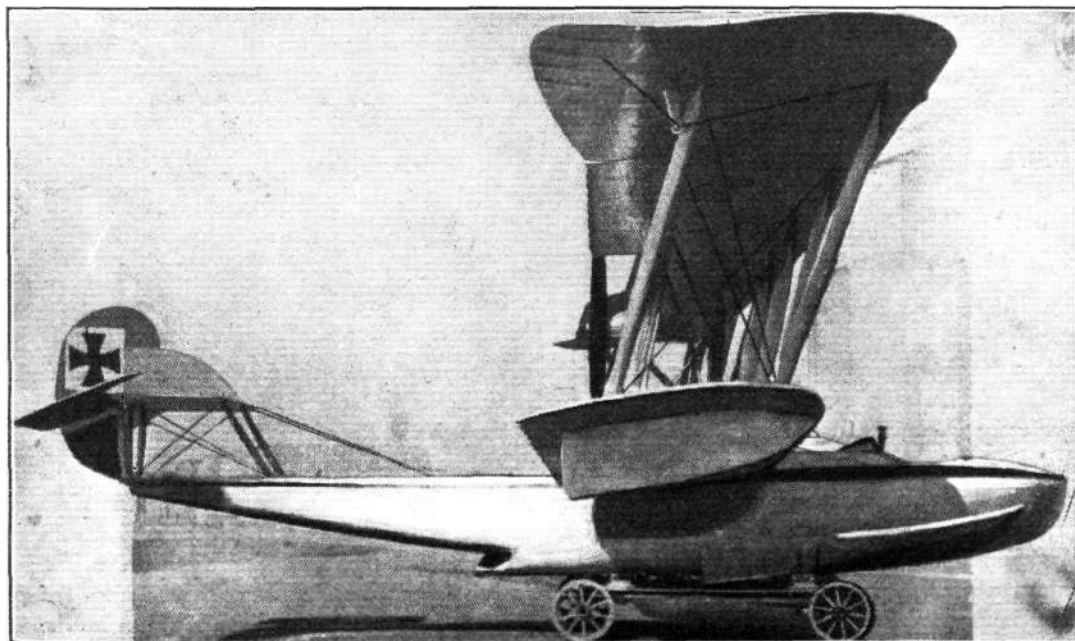


Fig. 6.—Oertz flying-boat (1917), with 240 h.p. Maybach engine

These spring boards are shown in illustrations 1 and 2.

"Already at the first attempt the boat flew well, and proved the soundness of its design. Especially was the transmission found to work well, although, on account of trouble with the engine itself, no flights of very long duration were attempted. The first

So absolutely 'right' was this boat, that it could be taken over by the Navy without any alterations whatever, and not long afterwards, piloted by Stagge, it was flying over Dover. Later boats of similar type are shown in Figs. 3 and 4.

"It was not long before a demand arose for larger and more powerful boats, and the Oertz Works

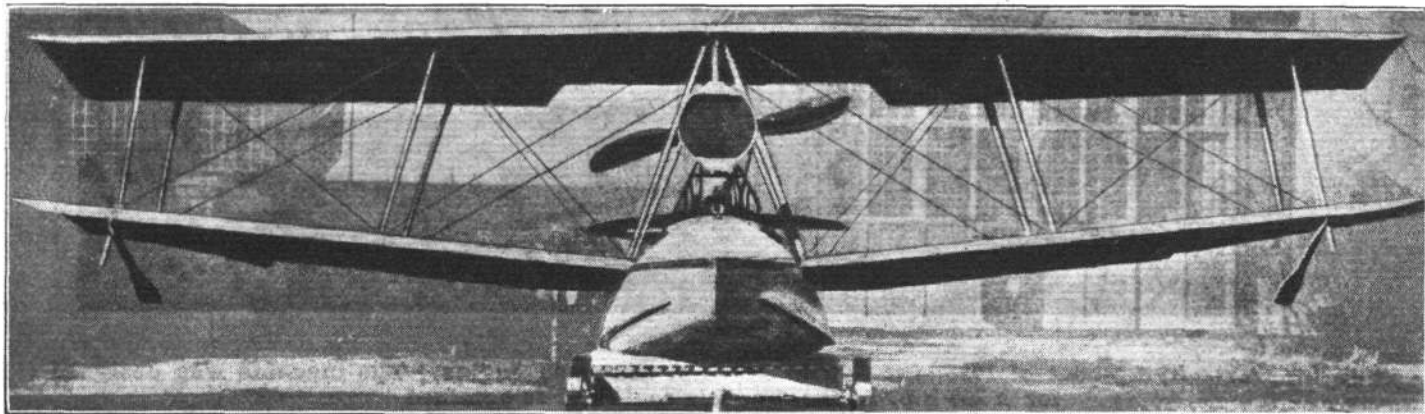


Fig. 7.—Front view of Oertz flying-boat, 1917

boat was perfectly smooth, that is to say, it had no step. In order to improve the getting off, experiments were then commenced on hulls provided with step. The first boat of the stepped type appeared in the spring of 1914, and is shown in Fig. 2. The machine was fitted with the first 160 h.p. Daimler engine. The photograph shows the general graceful lines of the hull and the large lower plane, which has upturned ailerons, after the manner of the old Tauben. The illustration also gives a good idea of the slanting inter-plane struts which, like those of the Hansa machines, gives equal distances between supports in upper and lower planes. On account of the late arrival of the engine, the boat was not ready for its first trial flight until two days before the great Warnemünde race planned for August of that year. All those who took part in the preparations for that

received an order for a series of flying boats, which were to be fitted with 260 h.p. Argus engines. Delivery of these engines was much delayed, and when they were available they proved to have exceeded the estimated weight to such an extent that it was quite out of the question to fit them in the Oertz boats. It was, therefore, decided to fit, instead, the 240 h.p. Maybach airship motors, which were at that time quite new. This was done, and in the autumn of 1915 the first of these boats could be delivered. In spite of the fact that the boats were really too large for the engines' power, which was lower than that for which they were designed, and that the engines were heavier than had been the estimated weight of the Argus engines, the boats were able to pass their acceptance tests. One of these boats is shown in Fig. 5.

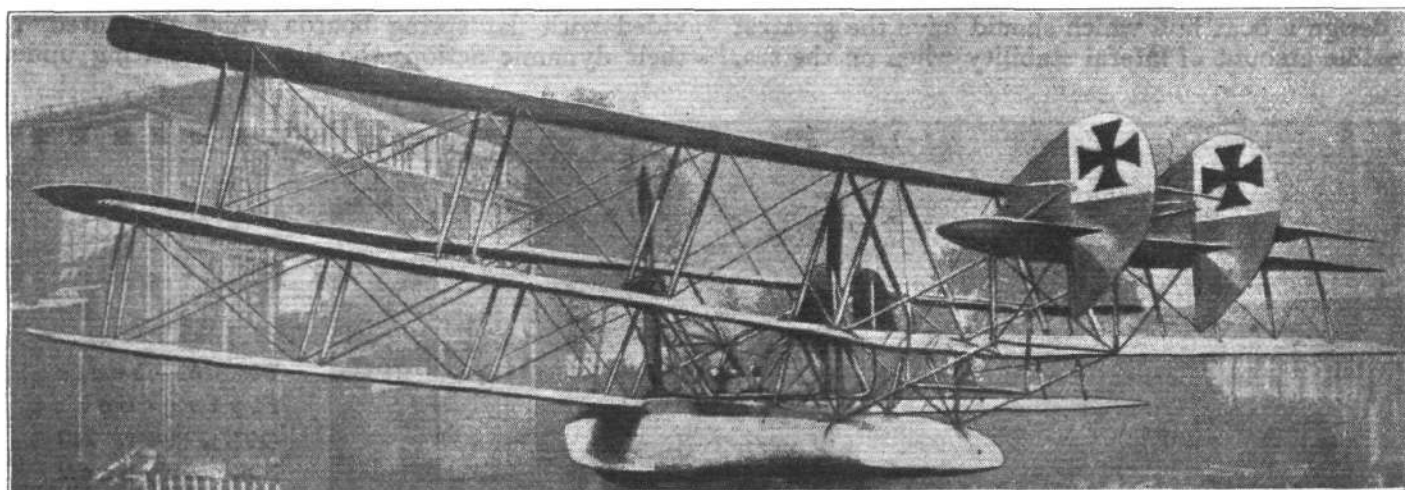


Fig. 8.—Three-quarter rear view of 1916 Oertz tandem biplane, known as the "Flying Schooner."

race, which was postponed owing to the outbreak of War, will still remember the splendid and startling performance of this boat, which was piloted by the late pilot Stagge, who, by the way, had never flown a seaplane before. This, however, did not prevent him from doing a series of stunts on this machine.

"Figs. 6 and 7 show an Oertz flying boat specially designed for the 240 h.p. Maybach engine. This machine was presented to the Navy by Messrs. Krupp von Bohlen and Halbach. All previous experience was taken advantage of in the design of this boat, and especially was the step question solved successfully.

The wing-tip spring boards were replaced with small, low-resistance wing-tip floats. [So they had to come back to them after all, in spite of the previous remarks as to the danger caused by them.—ED., FLIGHT.] The actual performance of this boat exceeded the estimated figures, the speed being 87 m.p.h., as against the estimated speed of 80 m.p.h.

finished in 1916. It was given the official, and more seamanlike, title of 'The Flying Schooner.' The 'Flying Schooner' had two 240 h.p. Maybach engines, placed side by side, and attained a speed of about 71 m.p.h., which was better than the speed predicted by Göttingen. The 'Flying Schooner' was especially good for starting and alighting. In order to enable

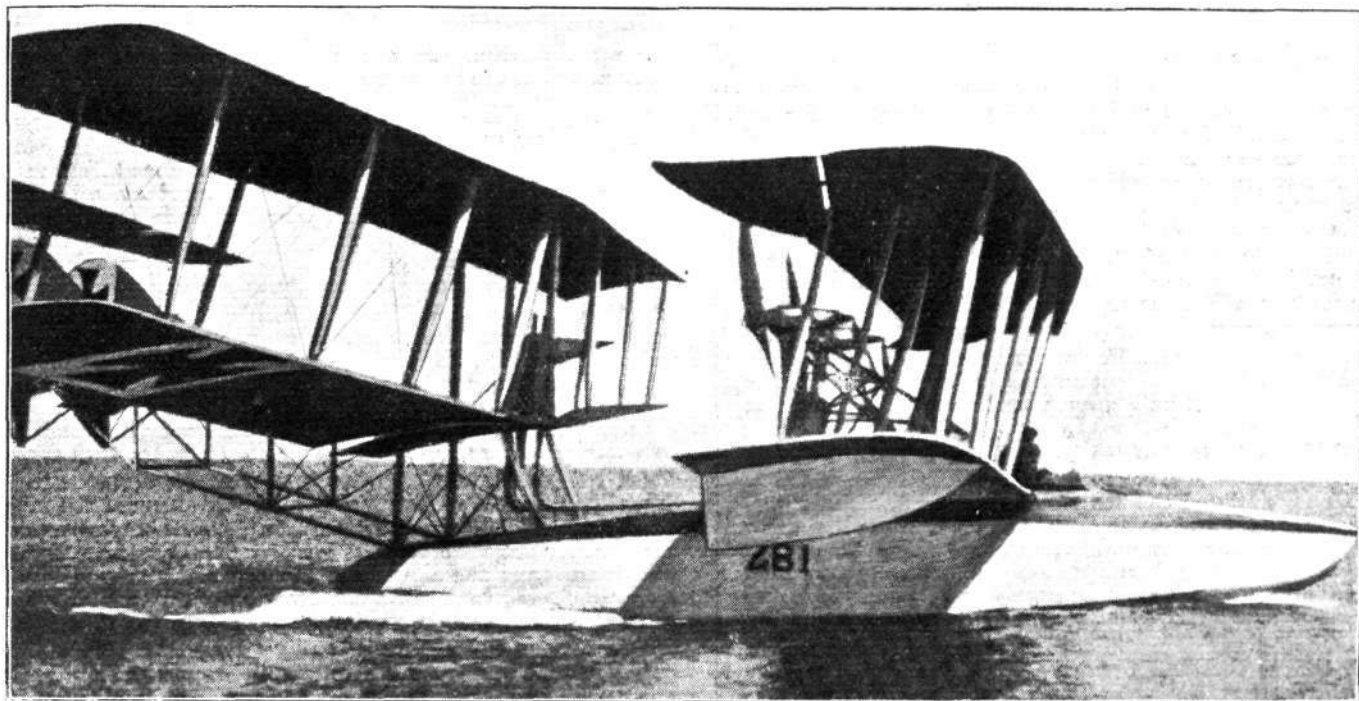


Fig. 9.—The Oertz "Flying Schooner" taxiing

This made the Oertz flying boat the fastest in the Navy.

"Already at the outbreak of war, Mr. Oertz was considering the design of large flying boats. In order to reduce the overall span of large machines, which may, under certain conditions, be a great disadvantage at sea, he evolved the, in itself, quite novel idea of constructing a tandem machine. [This is incorrect.

it to make shorter turns, inter-plane *ailerons* were fitted between the rear planes. These have not yet been fitted in the photograph, Fig. 8, but may be seen in Figs. 9 and 10.

"The appearance of the large fast American Curtiss flying boats in the War gave the impetus for us also to start construction of large boats to a considerable extent. In connection with the Bran-

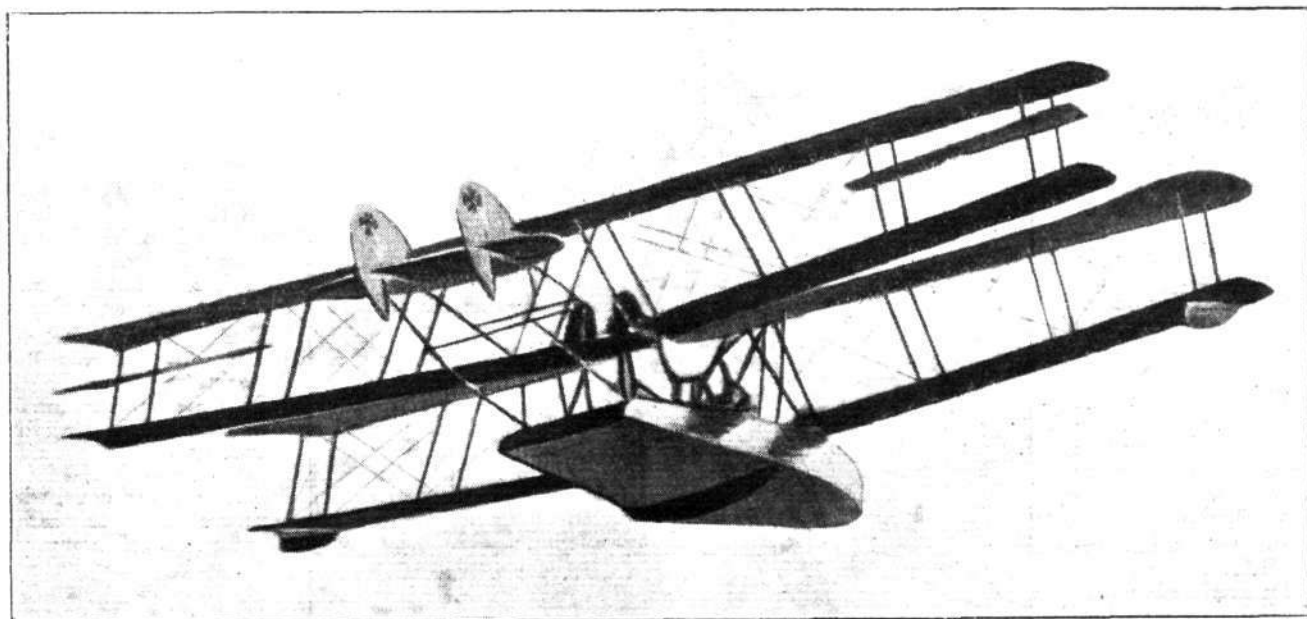


Fig. 10.—The Oertz "Flying Schooner" in the air

The tandem machine had already been considered, and, in fact, several had been built, although they could hardly be said to be very successful.—ED., FLIGHT.] After model tests by Professor Prandel at the Göttingen Laboratory, the construction shown in Figs. 7 to 10 was decided upon, and the boat was

denburg Aircraft Works, the construction of two large flying boats with two 300 h.p. engines was commenced. The hulls of these boats were already finished when the Armistice came, but the work on the complete boats was then stopped. May it be resumed again for the benefit of peaceful development."

AIRISMS

FROM THE FOUR WINDS

ON Monday last the Bishop of Versailles dedicated a chapel, for navigators of the air, to Our Lady of the Skies.

ITALY has presented two seaplanes to Brazil. We wonder why.

SPECIAL certificates, it was announced by Mr. Winston Churchill last July, would be later issued to all officers, non-commissioned officers and men who had been "Mentioned in Dispatches" for services in the field during the War. As there are so many in the R.A.F. who had this distinction, now that these "bits of paper" are being issued, the form which they take is of interest. The certificate, which is on thin white cardboard, measures $8\frac{1}{2}$ ins. in length by $7\frac{1}{4}$ ins. in depth. The inscription, which is printed in black in script lettering, is headed by the Royal Arms, and the following is the form in which the record is issued:—

The War of 1914-1918.
(Unit.)
(Number, rank, and name.)
was mentioned in a Dispatch from
Field-Marshal Sir Douglas Haig, K.T., G.C.B., G.C.V.O.,
K.C.I.E.,
dated the 8th November, 1918,
for gallant and distinguished services in the Field.
I have it in command from the King to record
His Majesty's
high appreciation of the services rendered.
WINSTON S. CHURCHILL,
Secretary of State for War.

War Office,
Whitehall, S.W.,
1st March, 1919.

A notice accompanying the certificate states that certificates are not being prepared in the order of date of award, and that any further certificate to which the recipient may be entitled will be forwarded in due course, no further application being necessary.

THE actual disposal of the air-fleet of Germany appears to be still in the balance. The *Intransigent*, a usually well-informed Paris contemporary, when dealing with the recent adoption by the Supreme Council of the report of the Inter-Allied Commission of Aeronautics, writes:—"According to the programme which was decided upon for the sharing out of the Zeppelins, France will have the first choice, then Great Britain, and then the United States. After this choice has been made, the remaining Zeppelins will be destroyed. The different Powers will also have the right to choose various makes of German aeroplanes, Belgium, Greece, Roumania, and Serbia also taking part in this partition. "No official confirmation of the destruction of Zeppelins by the Germans has been received, but it is known to the French authorities that German officers attached to the airship service are destroying all vessels, the existence

of which was not formerly known to the Allies. According to the terms of the Peace Treaty, the manufacture of German machines must cease six months after the ratification of the Treaty by three Powers. A factory at Dusseldorf is at present engaged in constructing a giant type of Zeppelin. The work is being hurried forward in order that it may be finished before the ratification of the Treaty."

LABRADOR is reported to be of great promise for the supply of wood-pulp. This fact emerges after a survey in aeroplanes, spread over a month, by members of an expedition to investigate the subject. Great lands, they report, exist from which millions of cords of pulp wood could be cut and rolled to streams for direct shipment.

"AMONG the goods sent to Paris by the Airco express aeroplane which left Hounslow at 12.30 was a tiny pedigree Persian kitten." And very interesting too, but we've looked in vain for the usual "interview" as to what Kitty thought about it all.

LAST Saturday a very heavy mist came over the land, and cross-country flights practically reached the impossible. So the Avros turned their attention to salvage operations. Before dawn the drone of twin engines was heard through the murk. The noise wandered uneasily to and fro, and it became evident that some large aeroplane was completely lost. Signals were made from the aerodrome without result; so at last an Avro was asked to perform the function of an aerial life-boat. It went up and groped about in the dark in the direction of the noise, and presently made out a large machine with 10 passengers aboard roaming unhappily round with a "four a.m. and I can't find the keyhole" air. The Avro pilot had to go cautiously, for when he began to fly towards the liner he lost sight of the aerodrome. However, he fired Verey lights

and presently attracted the attention of the liner and directed it safely to earth. It had taken an hour and a half to get to Hounslow from another London aerodrome, and, for once, the passengers were not sorry to be back on *terra firma*.

Again after dark that night an Avro had to go up to show the way to a second large machine which had lost its bearings.

R.N.L.I., please note.

"AN egg having on it clear impressions arranged in a circle like the figures on the dial of a clock has been laid at Walberton."—*Daily Paper*.

Some Monoplane feat, that! By encouragement there may be hope in this direction for the natural evolution of a really reliable drift-meter, direction finder, or other helpful air-instruments.

À propos of eggs, why not utilise the homely sand egg-boiler as an intimation to pilots in a fog that their machine is upside down. (Patented.)

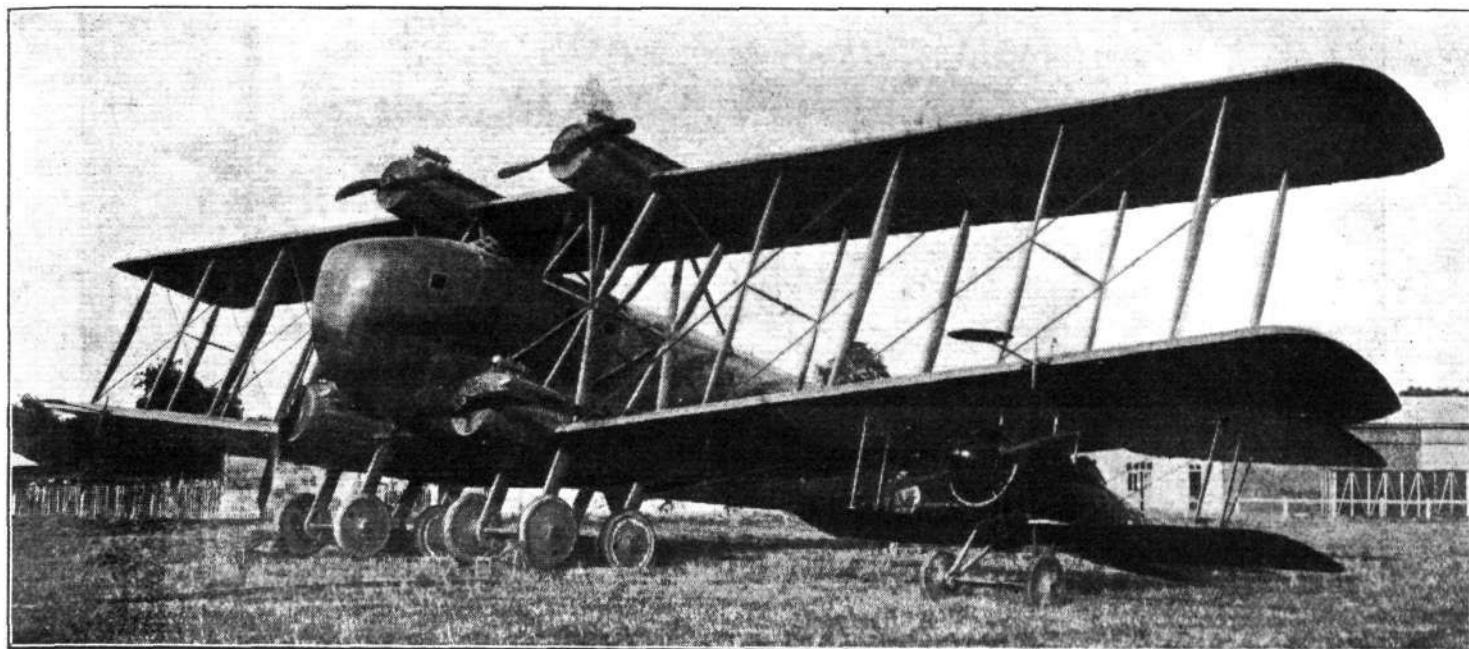
HE was an Air Force man, and he had patriotically undertaken to drive a train for a distance of some 36 miles as part of the journey.

He did it successfully in 25 minutes.

Some R.A.F. Impressions



Captain Lalley, M.C. and bar, O.C. 25th Squadron, Germany, who can do wonderful things with a Fokker



THE LATEST PRODUCTION FROM THE PIONEER HOUSE OF BLÉRIOT: The four-engined 28-passenger "Aerobus," which has recently passed its first tests. It has a total horse-power of 1,000, and a speed of 90 m.p.h.

Then all the passengers got out, and there was no comment.—(*Globetrotter.*)

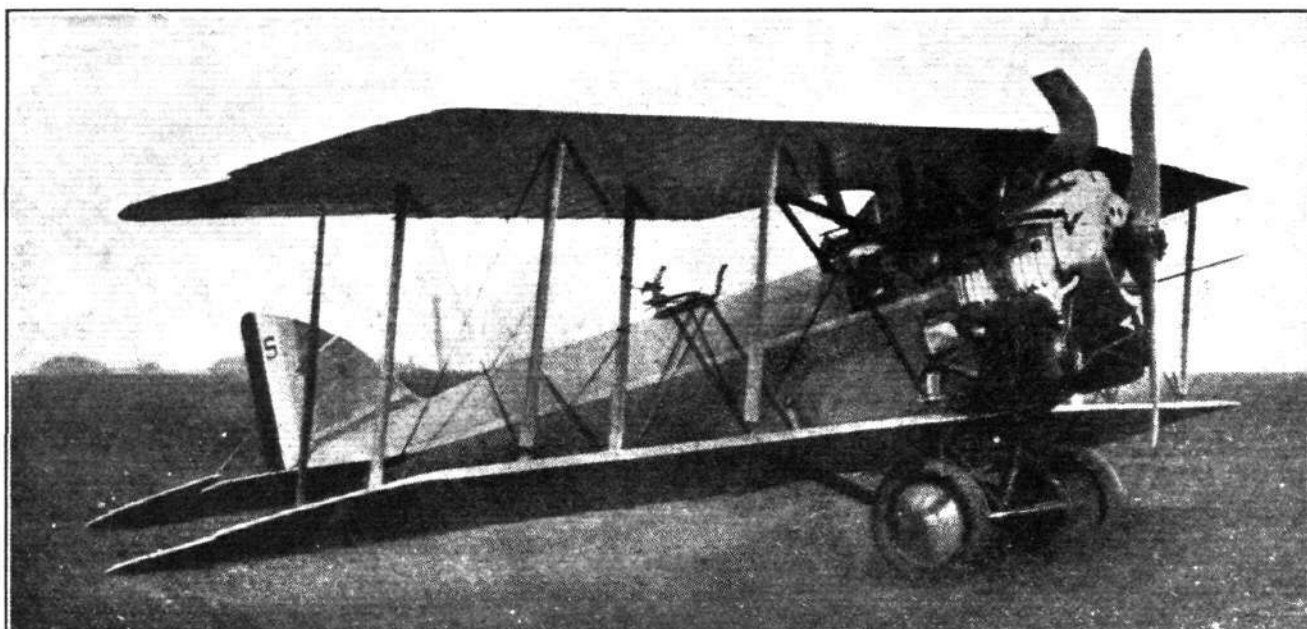
PROFITEERING this side the Channel is quite pronounced enough for most after-War citizens. But compared with France it would appear as if *our* commodities are actually being given away. Pretty steep measures are in preparation by the Senate for stamping-out some of the more flagrant abuses, but the *Temps* seems to have doubts as to their efficacy. In fact, they suggest that the very punishment proposed to be inflicted will probably lead to an intensification of the evil, as the guilty will just add their fines to the prices of their goods. What the figures to the public in France will mount up to under this eventuality is a bit puzzling when one finds the following items foreshadowed in the new measure, as an antidote to the profiteering virus which appears to have permeated the system of every man's son (and daughter) since the Hun first set his hordes roaming: Fines will be increased to £2,000, and in cases where the guilty persons are not *bona-fide* traders, but speculators pure and simple,

to £8,000, while the maximum period of imprisonment has been increased to five years. This augmentation of the terms of imprisonment is welcomed for the reason that the sentences passed upon profiteers have not up till now proved a deterrent. The profiteers paid the fines and went to prison, but resumed their illegal operations as soon as they regained their liberty. If light sentences were imposed, it was not because the magistrates were inclined to be lenient; it was because the law did not permit them to inflict heavier terms of imprisonment.

At least during the terms of imprisonment the rapacity of the individual will be temporarily checked; it should be only a question of laying the whole tribe to heel as quickly as possible. And there should be little chance of respite for the rapacious crowd, as never a voice was raised in the Senate to stay the increased fines and sentences embodied in the bill. Looks as if this were another little stunt which is done better in France, and might be well worth giving a trial trip over here.



Three-quarter rear view of the new Blériot four-engined 28-passenger "Aerobus," showing the biplane tail with its triple rudders.



THE MORANE FIGHTING BIPLANE, FITTED WITH A BUGATTI ENGINE : Note the "lobster-pot" radiators mounted below the engine, and the back-swept wings.

The King's Certificate to Invalidated R.A.F. Officers

THE Air Ministry announces that His Majesty the King has been pleased to approve of the issue of a certificate to officers who have relinquished their commissions during the War under the following circumstances:—

(a) Having served in a sea-going ship of war at sea, or abroad in a theatre of operations, since August 4, 1914, and who have been invalidated on account of ill-health or wounds, not due to misconduct, and where such is or are certified under the authority of the Air Council to be caused or aggravated by service.

(b) Having been invalidated on account of ill-health or wounds certified under the authority of the Air Council to have been caused or aggravated by service while engaged on flying duty at home in connection with operations against the enemy, or aerial coast patrol work, since August 4, 1914.

(c) Having been invalidated on account of disablement certified under the authority of the Air Council to be directly attributable to the action of the enemy, e.g., air raids or naval raids.

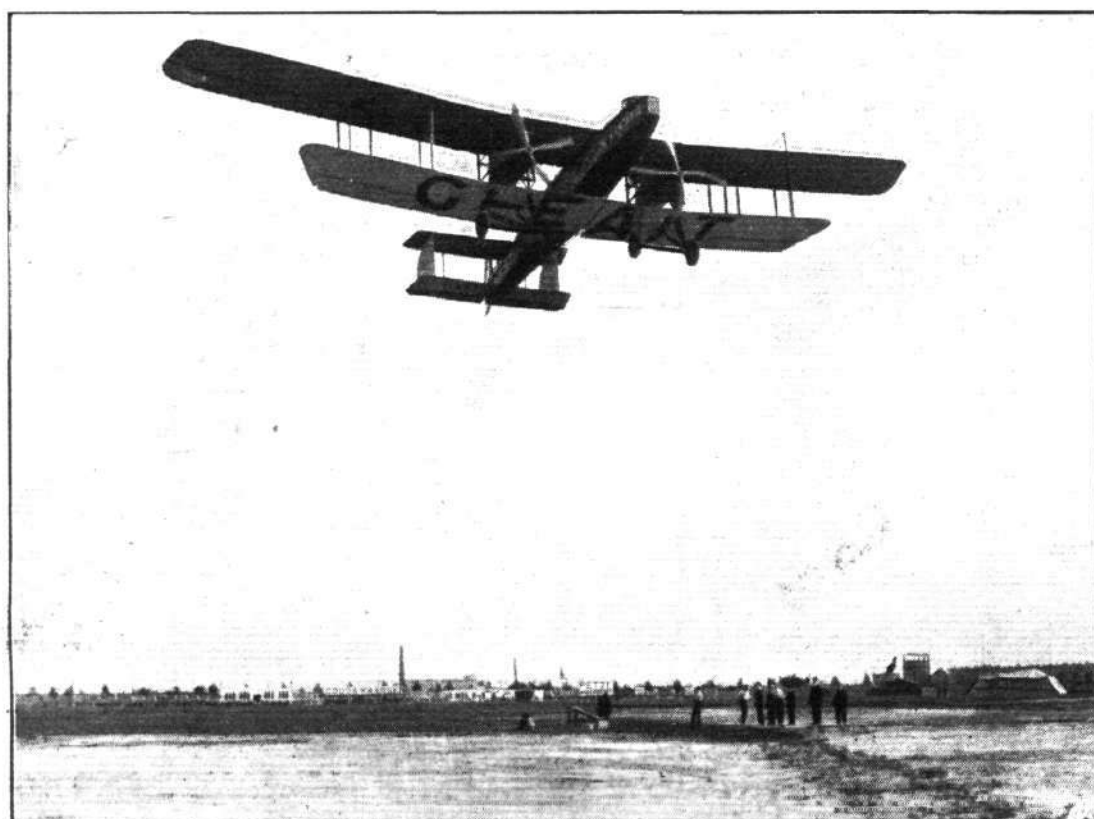
The certificates for officers of the R.F.C. who relinquished their commissions prior to April 1, 1918, will be issued under

the regulations laid down in Army Order 138 of 1918. The certificates for officers of the R.N.A.S. who relinquished their commissions prior to April 1, 1918, will be issued by the Admiralty.

His Majesty the King has further approved of the award of a special distinctive certificate to be entitled the King's Second Certificate, to officers who, after having become eligible for the award of the King's Certificate, voluntarily served again, and again relinquished their commissions during the War, under the circumstances detailed in paragraph 1 of this Order.

Applications from officers who have already left the Service, and who are entitled to these certificates should be addressed to The Secretary, Air Ministry (P.4 E.), Kingsway, London, W.C.2.

Applicants must state: (a) Full name and rank; (b) The grounds upon which the certificate is claimed; (c) Details of service for which it is claimed, including the branch or arm of H.M. Service in which the applicant was serving at the time; (d) Date of relinquishment of commission; (e) Whether a certificate has already been applied for or been granted, in respect of service in the ranks, etc.



Mr. R. Kenworthy at the "E.L.T.A." (Amsterdam) on the Blackburn Kangaroo, where he was busy carrying passengers continuously for six weeks or more. This machine was last week commandeered for Midlands and the North aerial-post work

THE ROYAL AIR FORCE

London Gazette, September 26, 1919.

Permanent Commissions.—The following are granted Permanent Commissions in the ranks stated, with effect from August 1, 1919:—

Group Captain.—E. M. Maitland, C.M.G., D.S.O., A.F.C.
Wing Commanders.—J. N. Fletcher, A.F.C.; T. R. Cave-Brown-Cave, C.B.E.; W. C. Hicks, A.F.C.; A. D. Cunningham, O.B.E.; J. W. O. Dalgleish, O.B.E.

Squadron Leaders.—E. H. Sparling; D. Harries, A.F.C.
Flight Lieutenants.—G. G. H. Cooke, D.S.C., A.F.C.; R. A. Cochrane, A.F.C.; R. S. Booth, A.F.C.; G. M. Thomas, D.F.C.; J. B. Cole Hamilton; T. P. Y. Moore; P. E. M. Maitland, A.F.C.; P. G. N. Ommanney; W. Underhill, D.S.C.; A. H. Wann; T. W. Elmhurst, A.F.C.; I. C. Little, A.F.C.; J. A. Barron; H. L. Rutty; F. L. C. Butcher; H. S. Scroggs; E. F. Turner, A.F.C.; R. S. Sugden, A.F.C.; R. S. Montagu, D.S.C.; H. V. Drew, A.F.C.; R. V. Goddard; J. H. Hagon; A. W. Mylne; C. W. C. Browne.

Flying Officer.—S. B. Harris, A.F.C.
 The undermentioned temporary appointments are made:—
Staff Officer, 3rd Class.—(Air)—Flight-Lieut. F. N. Halsted, D.S.C.; Sept. 15, 1919. (Substituted for the notification in the *Gazette* of Sept. 23, 1919.) (P.)—Lieut. F. W. Memory, Nov. 11, 1918, and to be actg. Capt. whilst so empld. (Substituted for the notification in the *Gazette* of Nov. 26, 1918.)

The undermentioned temporary appointments are made:—
Staff Officers, 2nd Class.—(P.)—Capt. R. B. Waite, M.B.E.; May 1, 1919. (T.)—Sqn. Ldr. R. K. Pillers, O.B.E., from S.O. 1; Sept. 15, 1919.
Staff Officer, 2nd Class (2nd Grade).—Lieut. (actg. Capt.) A. D. Carey, June 10, 1919, and to be actg. Maj. whilst so empld. The rank of Capt. G. S. Lardner is as now described, and not "Lieut." as stated in the *Gazette* of Sept. 9, 1919.

Flying Branch.

Maj. G. P. Wallace, D.S.O., to be actg. Lieut.-Col. whilst empld. as Lieut.-Col. (A.), from Feb. 27, 1919, to April 30, 1919. Maj. N. M. Martin to be Maj. (A.), from (S.O.), from Nov. 20, 1918, to Dec. 29, 1918.

The undermentioned Squadron Leaders (S.O.) to be Squadron Leaders (A.):—A. G. R. Garrod, M.C., D.F.C.; Sept. 6, 1919. P. C. Maltby, D.S.O., A.F.C.; Sept. 15, 1919.

Squadron Leader R. M. Field to be Squadron Leader (S.), from (S.O.); Sept. 15, 1919.
 Capt. L. D. McKean is graded for purposes of pay and allowances as Maj. whilst empld. as Maj. (A.), from May 1, 1919, to June 4, 1919. Capt. I. C. Little, A.F.C., is graded for purposes of pay and allowances as Maj. whilst empld. as Maj. (A'ship); May 1, 1919. Capt. G. E. Livock is graded for purposes of pay and allowances as Maj. whilst empld. as Maj. (S.) from May 1, 1919, to June 29, 1919.

The undermentioned Flight Lieuts. to be Flight Lieuts., from (S.O.):—Sept. 15, 1919—C. H. Keith (A.); F. W. Walker, D.S.C., A.F.C. (A. and S.); P. J. Sumner (K.B.); Sept. 10, 1919.

Capt. E. M. Pizey is graded for purposes of pay and allowances as Capt. whilst empld. as Capt. (A.); Nov. 25, 1918.

The undermentioned Lieuts to be actg. Capt. whilst empld. as Capt. (A.):—(Hon. Capt.) Alan Storey, D.F.C., from Nov. 21, 1918, to April 30, 1919; C. E. Maitland, D.F.C.; July 14, 1919. Lieut. O. R. Gayford, D.F.C., to be actg. Capt. whilst empld. as Capt. (O.); May 1, 1919. (Substituted for the notification in the *Gazette* of July 22, 1919.) Lieut. (Hon. Capt.) Alan Storey, D.F.C., is graded for purposes of pay and allowances as Capt. whilst empld. as Capt. (A.), from May 1, 1919, to June 15, 1919. Lieut. E. M. Henderson relinquishes the grading for pay and allowances as Capt. on ceasing to be empld. as Capt. (A.); July 25, 1919.

Flying Officer F. C. Deane to be Flying Officer (O.), from (Ad.); Aug. 30, 1919. Flying Officer A. F. Lang to be Flying Officer (O.) to (T.); Aug. 1, 1919.

The undermentioned 2nd Lieuts. to be Lieuts.:—(Hon. Lieut.) W. Bagnall; April 2, 1918. G. B. Emery; April 25, 1918. Fred Wood; Oct. 26, 1918. W. R. N. Cheetham; Jan. 5, 1919. L. Walsh; Jan. 16, 1919. F. W. Dunnett; Feb. 16, 1919. E. P. C. Godsil; April 2, 1919. O. V. Lee; April 25, 1919. R. D. Rogers; April 25, 1919. A. N. Abbott; May 8, 1919. J. G. Walton; June 6, 1919. V. G. Record; June 13, 1919. L. T. Wilson; July 5, 1919. W. Urwin; July 10, 1919.

2nd Lieut. S. W. Tatham (late Gen. List., R.F.C., on prob.) is confirmed in rank as 2nd Lieut. (A.); July 29, 1918.

177058 Cadet J. H. R. Hopkins is granted a temp. commn. as 2nd Lieut. (O.); Nov. 10, 1918.

The undermentioned relinquish their commns. on ceasing to be empld.:—Lieut. J. M. M. Hume (Lieut., Black Watch); Feb. 24, 1919. Lieut. R. Whyte; May 20, 1919. Aug. 26, 1919—Lieut. A. H. A. Alban, D.F.C. (Lieut., R.A.); Lieut. A. M. Diamant (Lieut., R.A.); Lieut. (Hon. Capt.) E. J. Long (Capt., Gordon Highrs.); Aug. 27, 1919. 2nd Lieut. (Hon. Lieut.) P. N. Mellitus (Lieut., R. War. R.); Aug. 30, 1919. 2nd Lieut. (Hon. Lieut.) N. MacLeod (Lieut., Seaforth Highrs.); Sept. 1, 1919. 2nd Lieut. (Hon. Lieut.) D. Neil (Lieut., Cam. Forestry Corps); Sept. 3, 1919. 2nd Lieut. T. W. Woodrow (Lieut., R.A.); Sept. 6, 1919. Lieut. W. E. Davis, M.C. (Lieut., Gloster R.); Sept. 11, 1919. Lieut. W. D. Robertson (Lieut., R.E.); Sept. 18, 1919.

Then follow the names of 87 officers who are transferred to the unempld. list under various dates.

Capt. A. H. Dalton (Lieut., Hussars) resigns his commn.; Sept. 27, 1919.

The undermentioned Lieuts. relinquish their commns. on account of ill-health contracted on active service, and are permitted to retain their rank:—A. Hartley; May 6, 1919. (Substituted for the notification in the *Gazette* of May 16, 1919.) H. H. House; Sept. 9, 1919.

Lieut. S. A. Harper, M.C. (Lieut., Cheshire R.), resigns his commn.; Sept. 27, 1919.

The undermentioned 2nd Lieuts. relinquish their commns. on account of ill-health, and are permitted to retain their rank:—W. P. Wemple; July 13, 1919. T. V. J. Nicholas, July 18, 1919. (Substituted for the notification in the *Gazette* of July 29, 1919, wherein this officer was described as 2nd Lieut. T. U. J. Nicholas.)

Capt. Kenneth Gordon Macdonald to take rank and precedence as if his appointment as Capt. bore date July 1, 1918.

The initials of 2nd Lieut. E. W. Cowdery are as now described, and not "E. D." as stated in the *Gazette* of July 1, 1919. The initials of Lieut. N. P. Edwards are as now described, and not "J. P." as stated in the *Gazette* of Aug. 22, 1919. The Christian names of 2nd Lieut. Gerald Marcus Jackson Morton are as now described, and not as stated in the *Gazette* of Aug. 30, 1918. The notifications in the *Gazette* of March 28, 1919, concerning 2nd Lieut. E. C. Heyes and Lieut. C. A. Jordan are cancelled. The notification in the *Gazette* of June 20, 1919, concerning Lieut. J. W. S. Mellish is cancelled.

The notification in the *Gazette* of July 11, 1919, concerning 2nd Lieut. Thomas Clifford Stranger is cancelled. The notification in the *Gazette* of Aug. 12, 1919, stands. The notifications in the *Gazette* of July 25, 1919, concerning 2nd Lieut. T. K. Ludgate and 2nd Lieut. W. P. Wemple are cancelled.

Administrative Branch.

Wing-Com. R. E. M. Russell, C.B.E., D.S.O., to be Wing-Com., from (S.O.); Aug. 30, 1919. Squadron Leader A. J. Currie to be Squadron Leader, from (S.O.); Sept. 3, 1919. Capt. A. W. Crombie to be Capt., from (T.); July 19, 1919. (Substituted for notification in the *Gazette* of Aug. 1, 1919.)

The undermentioned Flight-Lieuts. to be Flight-Lieuts., from (S.O.):—E. O'D. Crean; Aug. 29, 1919. F. F. Lloyd; Sept. 1, 1919. A. M. Waistell; Sept. 14, 1919. H. G. Hutchinson; Sept. 15, 1919.

Flight-Lieut. J. W. Havers to be Flight-Lieut., from (A'Shp.); Sept. 9, 1919.

Lieut. G. Roberts to be actg. Capt. whilst empld. as Capt.; June 3, 1919. The undermentioned Lieuts. are graded for purposes of pay and allowances as Capt. whilst empld. as Capt.:—May 1, 1919—P. E. D. Addis; W. Halliwell; F. J. Logan; T. Mack; V. G. Davis (to July 14, 1919). (Hon. Capt.) J. R. Gould; May 16, 1919.

Flying Officer (actg. Flight-Lieut.) J. C. Cantrill relinquishes the actg. rank of Flight-Lieut. on ceasing to be empld. as Flight-Lieut.; Sept. 3, 1919. Flying Officer F. Pratt relinquishes the grading for pay and allowances as S.O. 3 on ceasing to be specially empld.; Sept. 2, 1919.

The undermentioned Flying Officers (A.) to be Flying Officers: O. D. Freeman; Aug. 1, 1919. G. N. Prout; Aug. 21, 1919.

Lieut. I. MacL. Moffats to be Lieut., from (O.); Jan. 20, 1919. (Substituted for notification in the *Gazette* of March 4, 1919, wherein this officer's rank was shown as 2nd Lieut.)

The undermentioned Flying Officers to be Flying Officers, from (S.O.):—John Duncan; Sept. 1, 1919. W. F. Duff; Sept. 4, 1919. Sept. 15, 1919—G. D. Ashby; P. A. Simmonds.

Flying Officer (Hon. F./Lieut.) E. J. Langridge, M.B.E., to be Flying Officer, from (T.); Sept. 1, 1919.

The undermentioned Lieuts. and Qr.-Mrs., Gen. List, are granted temp. commns. as Lieuts.:—May 27, 1918—J. Hicks; G. Roberts; J. Sims.

The undermentioned 2nd Lieuts. to be actg. Lieuts. whilst empld. as Lieuts.: W. Fell, from Oct. 1, 1918, to April 30, 1919. (Substituted for notification in the *Gazette* of Nov. 26, 1919.) John Mellor, from Nov. 15, 1918, to April 30, 1919.

The undermentioned 2nd Lieuts. to be Lieuts.:—F. H. M. Francis-Hawkins; Dec. 15, 1918. G. E. Shipp; April 11, 1919. 2nd Lieut. John Harold Grey to be 2nd Lieut., from (O.); Jan. 3, 1919. (Substituted for notification in the *Gazette* of Mar. 25, 1919.)

The undermentioned relinquish their commns. on ceasing to be empld.:—Lieut. J. B. Edgar (Capt., R. Scots. Fus.); Oct. 11, 1918. Lieut. C. B. Millett; Feb. 28, 1919. Lieut. C. P. Sisley (Lieut., R.G.A.); June 17, 1919. Lieut. J. D. G. MacRae (Lieut., Sea. Highrs.); June 30, 1919. Capt. S. C. Renny (Capt., K.O.S.B.); July 1, 1919. Sec. Lieut. J. G. Berry; Aug. 24, 1919. Capt. C. W. Bright (Lieut., R.N.R.); Aug. 26, 1919. Capt. P. F. J. Kent (Lieut., Dragoon Guards), Sept. 6, 1919.

Then follow the names of 12 officers who are transferred to unempld. list under various dates.

Capt. W. S. Cole C.G.M., D.S.M., relinquishes his commn. on account of ill-health caused by wounds, and is permitted to retain his rank; Sept. 17, 1919. Lieut. (Hon. Capt.) Frederick John Smith relinquishes his commn. on account of ill-health contracted on active service, and is permitted to retain the rank of Capt.; Sept. 9, 1919.

2nd Lieut. W. K. Holms relinquishes his commn. on account of ill-health, and is permitted to retain his rank; Sept. 19, 1919. The notification in the *Gazette* of Feb. 28, 1919, concerning Lieut. J. Handley is cancelled. The notification in the *Gazette* of April 4, 1919, concerning Lieut. C. B. Millett is cancelled. The notification in the *Gazette* of May 27, 1919, concerning Lieut. N. M. Hoskins is cancelled. The notification in the *Gazette* of June 3, 1919, concerning Sec. Lieut. J. Macarthy is cancelled.

Technical Branch.

Maj. G. P. Grenfell, D.S.O., is graded for purposes of pay and allowances as Lieut.-Col. whilst empld. as Lieut.-Col., Grade (A.), from May 1, 1919, to July 31, 1919. (Substituted for notification in the *Gazette* of Sept. 9, 1919.) Maj. T. H. Vitty to be Maj., Grade (A.) from Grade (B.); July 24, 1919. Capt. F. H. Songhurst, M.B.E., is graded for purposes of pay and allowances as Maj. whilst empld. as Maj., Grade (A.), from May 1, 1919, to July 31, 1919.

Lieut. A. H. Hughes to be actg. Capt. whilst empld. as Capt., Grade (A.); June 20, 1919. Lieut. H. F. Wilkinson is graded for pay and allowances as Capt. whilst empld. as Capt., Grade (A.); May 1, 1919. Lieut. (Hon. Capt.) Cyril Chapman, D.S.C., is graded for purposes of pay and allowances as Capt. whilst empld. as Capt., Grade (A.), from (O.), from June 4, 1919, to July 31, 1919. Flight-Lieut. O. S. Stiles to be Flight-Lieut., Grade (B.), from (K.B.); Sept. 15, 1919.

The undermentioned Sec. Lieuts. to be actg. Capt. whilst empld. as Capt., Grade (B.):—H. C. Hull, from Jan. 12, 1919, to April 30, 1919. (Hon. Lieut.) W. A. Winter; May 1, 1919.

The undermentioned Flying Officers to be Flying Officers, Grade (A.):—H. Norrington, from (S.O.); Sept. 2, 1919. H. W. Armstrong, from (K.B.); Sept. 9, 1919. 2nd Lieut. (actg. Lieut.) J. A. Joyce to be actg. Lieut. whilst empld. as Lieut., Grade (A.), from Grade (B.), from Nov. 8, 1918, to April 30, 1919. Flying Officer J. M. McEntegart to be Flying Officer, Grade (B.), from (S.O.); Sept. 15, 1919.

The undermentioned relinquish their commns. on ceasing to be empld.:—Capt. G. H. J. Mercer (Lieut., D. of Corn. L.I.); Sept. 1, 1919. Col. the Hon. A. Stopford, C.M.G. (Capt., R.N.); Sept. 13, 1919.

Then follow the names of 17 officers who are transferred to the unempld. list under various dates.

Lieut. A. L. C. Fuller (Lieut., Dragoon Guards) resigns his commn.; Sept. 22, 1919.

The undermentioned Sec. Lieuts. relinquish their commns. on account of ill-health, and are permitted to retain their rank:—T. A. Russell; Sept. 6, 1919. G. Spurgen (contracted on active service); Sept. 10, 1919.

The surname of Capt. G. L. Godden is as now described, and not "Gooden," as stated in the *Gazette* of Aug. 19, 1919.

Medical Branch.

Capt. T. E. Mulvany relinquishes his commn. on account of ill-health contracted on active service, and is permitted to retain his rank; Aug. 13, 1919. (Substituted for the notification in the *Gazette* of Sept. 2, 1919.)

Memoranda.

Sec. Lieut. (Hon. Capt.) F. C. Marsh is granted the hon. rank of Maj.; July 4, 1919.

The undermentioned Overseas Cadets are granted temp. commns. as Sec. Lieuts. with effect from Feb. 15, 1919, and relinquish such commns., with permission to retain the rank, from the day following termination of the standardised voyage in the case of those claiming immediate repatriation, and from the day following demobilisation in England in all cases:—

316105 C. D. Hooper.

184852 Herbert Stanley Morris. (Since killed.)

Pilot Officer (Hon. Flying Officer) W. E. Cowie is transferred to unempld. list, from (S.O.); Sept. 3, 1919.

The surname of George Henry Piercy is as now described, and not "Piercey," as stated in the *Gazette* of June 24, 1919.

London Gazette, September 30, 1919.

Permanent Commissions.

The following are granted Permanent Commissions in the ranks stated, with effect from Aug. 1, 1919:—Squadron Leader E. J. C. Roberts; Flight-Lieut. R. G. Parry.

The notifications which appeared in the *Gazette* of Aug. 1, 1919, appointing the undermentioned officers to Permanent Commissions, are cancelled:—Maj. F. R. Stapleton-Cotton (T.); Capt. Gerald Allen (A.); Capt. E. P. Hardman, D.F.C. (A.); Capt. A. L. McFarlane (A.); Capt. L. H. T. Sloan (A.); Capt. R. B. Tomlinson (T.); Lieut. D. G. McGregor, A.F.C. (O.); Lieut. G. S. Peffers, D.F.C. (A.).

The surname of Maj. W. A. McClaughry, D.S.O., M.C., D.F.C. (A.), is as now described, and not "McLaughry," as in the *Gazette* of Aug. 22, 1919. The rank of Squadron Leader W. C. Hicks, A.F.C., is as now described, and not "Wing-Com." as stated in the *Gazette* of Sept. 26, 1919.

The undermentioned temporary appointment is made:—

Staff Officer, 3rd Class.—(Air)—Flight-Lieut. C. F. Gordon, O.B.E., M.C., Sept. 18, 1919.

Group Captain (Staff).—Group Capt. A. M. Bent, C.M.G., C.B.E., relinquishes the grading for purposes of pay and allowances as Air Commodore; Sept. 15, 1919.

Flying Branch.

The undermentioned Sec. Lieuts. to be Lieuts.:—F. de M. Hyde; April 13, 1919. D. O. Onslow-Carleton; May 8, 1919.

H. V. N. Banks (Lieut., R.E.) is granted a temp. commn. as Sec. Lieut. (O); April 24, 1918, and to be Hon. Lieut.

The undermentioned relinquish their commns. on ceasing to be empld.:—Sec. Lieut. J. C. Bowstead, D.C.M., M.M. (Lieut., Norf. R.); April 9, 1919. Lieut. H. B. Mason (Lieut., R.A.); April 30, 1919. Lieut. D. P. F. Uniacke (Lieut., R. Irish Rifles); May 12, 1919. Sec. Lieut. P. J. A. Fleming; June 3, 1919. (Substituted for the notification in the *Gazette* of June 13, 1919.) Lieut. T. M. Draper; June 12, 1919. Lieut. A. W. Davison (Lieut., Wiltshire R.); June 13, 1919. (Substituted for the notification in the *Gazette* of Aug. 5, 1919.) Sec. Lieut. (Hon. Lieut.) H. W. Blakeney, M.C. (Lieut., R.E.); Sept. 5, 1919. Lieut.-Col. E. T. R. Chambers, A.F.C. (Lieut.-Com., R.N.); Sept. 8, 1919. Capt. J. G. Selby, M.C. (Capt., R.H. and R.F.A.); Sept. 15, 1919. Lieut. G. D. Gillie (Lieut., E. Ont. R.); Sept. 21, 1919. (Substituted for the notification in the *Gazette* of May 27, 1919.) Lieut. E. J. H. Dough (Lieut., R.G.A.); Sept. 22, 1919. Lieut. A. W. Frazer (Sec. Lieut., S. Wales Borderers); Sept. 23, 1919.

Then follow the names of 127 officers who are transferred to the unempld. list under various dates.

Lieut. R. Coop relinquishes his commn. on account of ill-health caused by wounds, and is permitted to retain his rank; Aug. 9, 1919. (Substituted for the notification in the *Gazette* of Aug. 8, 1919.)

The undermentioned Sec. Lieuts. relinquish their commns. on account of ill-health, and are permitted to retain their rank:—H. P. Brumell (caused by wounds); July 7, 1919. Alex. Boyce McDonald (caused by wounds); Aug. 13, 1919. Oct. 1, 1919—W. M. Hall; John Rhodes (W. Yorks. R.).

The surname of Sec. Lieut. Arthur Fred Belyea is as now described and not "Beyles" as stated in the *Gazette* of July 2, 1918.

The notification in the *Gazette* of Sept. 3, 1918, concerning Harry Thomas Daniel is cancelled. The notification in the *Gazette* of Nov. 29, 1918, concerning Joseph Wilfred Lavoie is cancelled. The notification in the *Gazette*

of Dec. 31, 1918, concerning 2nd Lieut. H. Clarke is cancelled. The notification in the *Gazette* of Jan. 28, 1919, concerning Sec. Lieut. J. S. Ford is cancelled. The notification in the *Gazette* of March 11, 1919, concerning Sec. Lieut. D. A. Jones is cancelled. The notification in the *Gazette* of April 1, 1919, concerning Sec. Lieut. (Hon. Lieut.) A. Mills, D.F.C., is cancelled. The notification in the *Gazette* of May 9, 1919, concerning 2nd Lieut. J. E. H. Chadwick is cancelled. The notification in the *Gazette* of May 27, 1919, concerning Sec. Lieut. Wm. Anderson is cancelled. The notification in the *Gazette* of June 13, 1919, concerning Sec. Lieut. P. J. A. Fleming is cancelled. The notification in the *Gazette* of July 1, 1919, concerning Lieut. C. C. Miller is cancelled. The notification in the *Gazette* of July 29, 1919, concerning Sec. Lieut. H. A. Thompson is cancelled. The notification in the *Gazette* of Aug. 5, 1919, concerning Lieut. A. W. Davison is cancelled.

Administrative Branch.

Sec. Lieut. Harold Clarke to be Lieut.; June 19, 1918.

The undermentioned relinquish their commns. on ceasing to be empld.:—Lieut. O. Dunkerley (Paymaster Sub-Lieut., R.N.); Sept. 29, 1918. Lieut. J. A. V. Duff (Lieut., Rifle Bde.); May 20, 1919. Lieut.-Col. J. W. L. Hunt (Lieut.-Com., R.N.); Sept. 5, 1919.

Then follow the names of 19 officers who are transferred to unempld. list under various dates.

The undermentioned Lieuts. relinquish their commns. on account of ill-health contracted on active service, and are permitted to retain their rank:—H. C. R. Milward; Sept. 17, 1919. A. H. Lancaster, Sept. 19, 1919. Sec. Lieut. G. M. M. Clune relinquishes his commn. on account of ill-health, and is granted the rank of Lieut.; Aug. 7, 1919. Lieut. M. J. J. G. Mare-Montebault, M.C. (N. Somerset Yeo.), relinquishes his commn. on account of ill-health contracted on active service; April 10, 1919. Lieut. J. B. Tait (Lieut., Dur. L.I.) resigns his commn.; Oct. 1, 1919. Sec. Lieut. W. J. Washer relinquishes his commn. on account of ill-health, and is permitted to retain his rank; Aug. 7, 1919.

Technical Branch.

Lieut. R. S. Haward to be Lieut., Grade (B.), from (A.); April 4, 1918.

The undermentioned Sec. Lieuts. to be Lieuts.:—April 2, 1918—(Hon. Lieut.) (Actg. Capt.) L. W. Allen, and to retain the actg. rank of Capt. until April 30, 1919. (Hon. Lieut.) C. Bishop (without pay and allowances prior to Feb. 15, 1919.)

The undermentioned Sec. Lieuts. to be Lieuts., without pay and allowances of that rank:—W. Hallet-Carpenter; April 2, 1918. A. S. G. Smith; June 12, 1918. A. H. Varian; Nov. 22, 1919. (Substituted for the notification in the *Gazette* of July 29, 1919.) J. E. McCrea; July 28, 1919.

Sec. Lieut. (Hon. Lieut.) W. J. G. Barnes (Lieut., R. Scots Fus.) relinquishes his commn. on ceasing to be empld.; Sept. 11, 1919.

Then follows the names of 16 officers who are transferred to unempld. list under various dates.

Sec. Lieut. J. S. Forder relinquishes his commn. on account of ill-health, and is permitted to retain his rank; Jan. 29, 1919.

The notification in the *Gazette* of May 24, 1918, concerning Lieut. R. S. Haward, is cancelled.

Memoranda.

Lieut. W. J. E. Owen is granted the Hon. rank of Capt.; Aug. 31, 1918.

Then follow the names of 2 Overseas Cadets who are granted temp. commns. as Sec. Lieuts., and 24 Cadets who are granted hon. commns. as Sec. Lieuts. Lieut.-Col. R. G. Cherry, M.C. (Maj., R. Regt. Art.), relinquishes his commn. on ceasing to be empld.; Sept. 15, 1919.

The undermentioned temp. Hon. Lieuts. relinquish their commns. on ceasing to be empld.:—F. W. Hedgecock; Aug. 20, 1919; H. Bedson; Sept. 16, 1919.

The undermentioned are transferred to unempld. list:—Flying Officer S. T. Smith, from (S.O.); Sept. 13, 1919. Flight-Lieut. L. Henshall, M.B.E., from (S.O.); Sept. 15, 1919. Sept. 16, 1919—Flying Officer C. T. Inman from (S.O.); Flying Officer T. T. Pickup, from (S.O.).

The undermentioned Sec. Lieuts. relinquish their commns. on account of ill-health, and are permitted to retain their rank:—Oct. 1, 1919—Ernest Earl; P. E. B. Holliswell.

The notifications in the *Gazette* of Sept. 23, 1919, concerning Lieut. F. W. Hedgecock, are cancelled. The notifications in the *Gazette* of Sept. 23, 1919 concerning Lieut. H. Bedson are cancelled.



Personals

Married

CYRIL DAVENPORT SIDDELEY, eldest son of John Davenport Siddeley, C.B.E., and Mrs. Siddeley, of Crackley Hall, Kenilworth, was married on September 30 at St. Martin's Church, Scarborough, to MARJORIE TENNANT, eldest daughter of HARRY TENNANT FIRTH and Mrs. Firth, of Woodleigh, Dewsbury.

To be Married

The engagement is announced between Lieut. HARRY FLETCHER ATTWATER, Northumberland Fusiliers (attached R.A.F.), eldest son of the late Rev. H. S. Attwater and Mrs. Attwater, of Lytham, and WINSOME WINGATE WHEATLEY, elder daughter of Lieut.-Col. J. P. D. Wheatley, R.F.A., and Mrs. Wheatley, Carlisle.

The engagement is announced between Lieut. REGINALD LONGMAN, R.A.F., youngest son of Mrs. C. Longman, Wryde, Raymead Avenue, Thornton Heath, and OLIVE, eldest daughter of Mr. and Mrs. PERCY EDSALL, Hughenden, Dunheved Road North, West Croydon.

The engagement is announced between KENNETH ARTHUR SETH-SMITH, 5th Fusiliers, attached R.A.F., youngest son of Mr. and Mrs. Martin Seth-Smith, Colwood, Bolney, Sussex, and DORIS ROBERTA, only daughter of Lieut.-Col. R. W.

McKERGOW, O.B.E., M.F.H., and Mrs. McKergow, Twineham Grange, Sussex.

Item

Mr. BENNETT MELVILLE JONES, of Emmanuel College, Cambridge, who has been elected to the Francis Mond Professorship of Aeronautical Engineering at Cambridge University, entered Emmanuel College as an exhibitioner, became a scholar, and obtained first-class honours in the Mechanical Sciences Tripos in 1909. For some years he was employed on aeronautical research at the N.P.L., leaving in May, 1913, to take up the designing of rigid airships for Armstrong, Whitworth and Co., and in September, 1914, he joined the Royal Aircraft Establishment, remaining there until May, 1916. From there he went to the Orfordness Armament Experimental Station, with the rank of Capt., R.F.C., and eventually he became Assistant-Controller of Experiment and Research with the rank of Lieut.-Col., R.A.F. His chief activities were directed towards aerial gunnery and bombing, and in order to gain experience of fighting conditions, he qualified as a pilot and served with No. 48 Squadron, R.F.C., in France during the early months of 1918. On being demobilised Mr. Jones was elected Junior Fellow of Emmanuel College, Cambridge, with the post of Director of Engineering Studies at the college.

SIDE-WINDS

FROM an announcement which appears elsewhere in this issue it will be observed that Messrs. W. A. and R. J. Jacobs, Ltd., will shortly be installed in their new factory at Electary Works, Colin-Deep, Hendon. This move will provide an opportunity for those who wish to add to their plant, of acquiring a few useful items of this kind, as Messrs. Jacobs, Ltd., find that some of the machinery in their works at Leonard Street, Finsbury, will be surplus to their requirements. They will be pleased to send particulars to anyone interested.

WE understand from Messrs. Burton, Griffiths and Co., Ltd., of 1, 2, and 3, Ludgate Square, London, E.C. 4, who have been associated with the Birmingham Small Arms Co., Ltd., for many years past as their sole representatives and agents for the sale of their high-speed steel twist drills, milling cutters, etc., that in view of further developments, the directors of this company, in conjunction with the directors of the Birmingham Small Arms Co., have considered that a closer connection would be mutually advantageous. In consequence, an exchange of shares has taken place, by which the interests of the two firms become synonymous. This will in no way affect the name, conduct, or the management of the business, which will be carried on as heretofore, but the closer association of this old and very powerful organisation will enable the firm to extend their business in other spheres.

ONE hopeful feature at the moment to those of us who are engaged in British engineering business, is the anxiety shown by the residents in Overseas countries to avail themselves of the technical assistance of British business men. Perhaps this has nowhere been more apparent than in London. Within the last four months Barimar, Ltd., have been asked to co-operate in the establishment of 15 branch scientific welding businesses in various parts of the world, from Scandinavia at one end to Australia at the other, from France in the west, to Greece and India in the east, and in South and East Africa. These new Overseas establishments will furnish excellent openings for young British engineers at good rates of pay, and quite a number of Barimar-trained men are shortly proceeding to positions abroad. All the new branches will be completely equipped with British machinery, and run by British men, and it seems to us that the establishments must inevitably lead to healthy extensions of British trade and British influence.

RECENTLY attention was drawn to the improvements effected by the Dissolved Acetylene Co. in the containers, and it may further be pointed out that the gas before being compressed into the cylinders is produced in generators operating on the carbide-to-water principle and in the presence of a considerable excess of water. This prevents overheating and polymerisation in the generator. Generators of any other type invariably overheat the gas in course of manufacture, and thus lose the heat of dissociation which represents approximately 16½ per cent. of the total heating value of the gas. The gas manufactured by this firm is, after generation, treated by six processes of purification, so as to extract all moisture and impurities.

A SIMPLE method of testing acetylene gas for purity is to expose to a jet of the gas a piece of white absorbent paper moistened with a 10 per cent. solution of silver nitrate, for a period of 15 seconds. If the paper is discoloured it indicates the presence of sulphur and phosphorous impurities. A pure gas leaves the prepared paper quite white.

THE Dissolved Acetylene Co. supply their gas under a guarantee of purity. In addition to the quality, the quantity is also guaranteed, as the cylinders are filled and the gas is sold by weight; 1.1 ozs. of acetylene being equal to 1 cub. ft. A purchaser can, therefore, always ascertain whether he is receiving the quantity of gas for which he is charged. For the manufacture of their cylinders and gas, the company employ an efficient staff of engineers and chemists, who are constantly engaged in maintaining and improving the quality of the firm's products. We may add that the latest im-

provement is the method of compressing acetylene at low temperatures by a patent process of which the Dissolved Acetylene Co. are the sole proprietors. By this method a cylinder which has hitherto required to remain on the compressing racks before being completely filled for a period of from three to five days, can now receive its full complement of gas in a similar number of hours.

ONE example of Palmer enterprise during the recent strike troubles deserves to be recorded. Two sets of aeroplane landing-wheels and tyres to suit the special conditions of the Dutch landing-grounds were required in a hurry for the B.A.T. machine which was to take the mails to Amsterdam. The Palmer Tyre, Ltd., (whose landing-wheels and tyres were fitted to every bombing and fighting aeroplane that left these shores during the Great War) did not happen to have this particular type in stock in London at the moment, but they immediately got into touch with their Paris representative who handed the tyres over to Aerial Transport and Travel, Ltd., for despatch by the next Airco machine. Within five hours these landing-wheels and tyres were over here and ready for fitting to the British Aerial Transport Co.'s machine.

A TRIPLEX safety glass wind-screen is now included as standard in the specification of the 11.9 h.p. "H.E." light car, a new production manufactured by the Herbert Engineering Co., of Reading. The approximate cost of a car is £400 for a two-seater, and £425 for a five-seater. The owner of an "H.E." light car who takes out a "Triplex Policy" will thus make a saving of about £2 per annum on his premium.

ABOUT thirty little brothers and sisters of the famous Avro Baby are soon to make their appearance in the world. Flying men do not need to be reminded of the original Baby's triumphs in the sealed handicap of the Aerial Derby, of other wins at Hendon, and of the sensation it created at Amsterdam. But 25 miles on the gallon of petrol at 70 m.p.h. are figures to give food for thought to business men who have mastered the art of flying, especially in view of the recent transport upheaval. It would be interesting to have a peep at Sir Philip Sassoon's diary during the past ten days.

THE first instance of an aeroplane being used for transporting dope has occurred this week. Messrs. Pasche and Co., of Vickers House, the Hague, the Dutch representatives of the British Emaillite Company, on Monday afternoon wired over for a supply of Emaillite, Scheme "X," khaki pigment, for Dutch Government machines. The wire arrived on Monday at 5 p.m. and at 11.30 a.m. on Tuesday the consignment left Hounslow on the B.A.T. 3-seater machine for Utrecht, where it was placed on rail for the Hague. Such expedition would be hard to beat.

QUITE informal was a dinner given by Messrs. Robert Ingham Clark and Co., Ltd., on September 26th, to all their employees who served in the Great War, and it was therefore a most cheerful affair, enabling, as it did, the executive and the operative staffs to get into closer personal touch than is possible in the ordinary way. A novel programme was drawn up, and both this as well as the peace souvenir, containing portraits of those members of the firm who joined up, will be treasured as permanent reminders of a pleasant gathering. During the evening a number of musical items and recitations were given.

It is officially announced that Mr. Frank Shearman, chairman and managing director of the Mount Stuart Dry Docks, Ltd., Cardiff, has been appointed to a seat on the board of Messrs. J. Samuel White and Co., Ltd., the well-known shipbuilders and engineers of Cowes, Isle of Wight. Mr. Shearman is connected with several engineering and ship-repairing establishments in South Wales, and is also chairman of the Times Shipping Co., Ltd., of Cardiff.



Admiral Koltchak thanks French Flyers

ADMIRAL KOLTCHAK has published an order of the day thanking the French flying detachment which is taking part in the operations on the Siberian front.

Above the Fjords

FRIEDRICH CHRISTIANSEN, the German pilot, is credited with having made a successful flight from Bergen to the North Cape and back, but details are lacking.

AN AVRO CIRCUS IN HOLLAND

AFTER the close of the E.L.T.A. Exhibition (is it a redundancy to add the word Exhibition?) on September 14, three Avro three-seaters and one five-seater flew to Ockenberg, near The Hague. The pilots were Messrs. W. G. R. Hinchliffe, D.F.C., A.F.C., D. Shanks, F. P. Adams and Smith. There they again found a bad aerodrome, and did not enjoy the best of weather. They stayed there, however, for September 26, 27 and 28, took up passengers, and did quite well. The Avro is already accepted in Holland as *par excellence* the machine for pleasure flying.

They next proceeded to Middelharnis, and operated there on October 3 and 4. This town is a charmingly picturesque capital of an old-world Dutch island, and, as someone remarked, it seemed sacrilege for such a blatantly modern invention as an aeroplane to break in on its mediæval calm. Passengers in wooden clogs and flying helmets typified the paradoxical situation. However, the rustic Hollander took to the air as readily as Van Tromp and de Reuter took to the water. The short meeting was a great success, and the enthusiasm of the people was unbounded. All the pilots were garlanded *more Indico* with really beautiful wreaths of roses and other flowers. The Hollanders throughout were charming hosts, but in the Netherlands, as elsewhere, the grumpy farmer provides occasional comic relief. Once Shanks had a forced landing in a meadow, put things right himself, and flew away. Later, a letter was received from the farmer, backed by the local burgomaster, complaining that in the field there had been a horse which was so frightened by the engine that it had since *nearly* had an accident. Likewise two cows had given less milk since the occurrence, and the farmer felt morally convinced that there would be other consequences. He thought that 200 guilders (about £20) would no more than meet the moral and material damage.

The three three-seaters flew back to England on October 5. They carried extra supplies of petrol, landed on the beach at Calais and filled up their own tanks. The mist hung low over the Channel and over Kent, and the last stage of the journey was an anxious time for the pilots, but they felt their way round the hills and arrived safely.

The actual flying time for these three machines on their journey home from Amsterdam was 3 hours 30 mins.

The pilots are returning by boat to Holland to use the other Avros which are over there to give the Hollanders a little more enjoyment—and, incidentally, to revel themselves in unrestricted butter and sugar.



FLYING AT CAMBRIDGE AND SKEGNESS

DURING the week the Cambridge School of Flying have carried numerous passengers at Skegness and Cambridge, and have, in addition, had the honour of carrying the first air mail to Cambridge and London from Skegness.

One flight was made to an aerodrome near Wickford, Essex, and several to Friestone.

Preparations are being made for the arrival of undergraduates in Cambridge, many of whom it is hoped will try their hand at flying while up this term. Ex-pilots have the opportunity to get solo flying by means of a flying club formed by the above company. The flying at Skegness has been a great success, and Lieut. Fresson became quite a popular hero.



Extra Leave for Officers and Men of the R.A.F.

THE Air Ministry announces that officers and other ranks of the R.A.F. who were on leave in the United Kingdom on September 27 will be considered to have their leave cancelled with effect from that date and will be entitled as from October 8 (inclusive) to the remaining portion of their leave *plus* seven extra days.

Those officers and airmen who volunteered their services and were employed on duty in connection with the railway strike, but who were not on leave on September 27, will, on completion of this duty: (1) If on the home establishment, return to their units and then receive seven days' pay. (2) If from France, Flanders, or the Rhine, report to the O.C. R.A.F., Manston, near Ramsgate, who will then grant them seven days' leave pending their return to their units. Vouchers will be given for these leave journeys.



PUBLICATIONS RECEIVED

Special Missions of the Air. By Jacques Mortane. London: Aeroplane and General Publishing Co., Ltd., 61, Carey Street, Chancery Lane.

Lord Fisher on the Navy. London: Hodder and Stoughton.

Electric Spark Ignition. By J. D. Morgan. London: Crosby Lockwood and Son.

NEW COMPANIES REGISTERED

COLWICK MOTORS AND GENERAL ENGINEERING CO., LTD., Colwick Works, Old Colwick, Notts.—Capital £10,000, in £1 shares. Aeronautical and automobile engineers and manufacturers of motor chassis, etc. First directors: C. P. Pullinger, D. M. Shaw, W. Allan, H. Beech, F. B. Miller, H. E. Town, F. Clarke and R. Stevenson.

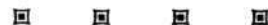
GILBERT CAMPLING, LTD.—Capital £200,000, in £1 shares. Under agreements with Gilbert Campling, Ltd. (incorporated in 1919) and its liquidator, and the Selsdon Aero Engineering Co., Ltd., and its liquidator, manufacturers of and dealers in motor vehicles, aeroplanes, etc.

W. D. ODDY AND CO., LTD., Propeller Works, Globe Road, Leeds.—Capital £25,000, in £1 shares. Manufacturers of aircraft propellers and accessories, etc., appertaining to aircraft. First directors: W. D. Oddy and R. Blackburn.

OGILVIE AND PARTNERS, LTD.—Capital £10,000 in £1 shares. Acquiring business of a consulting aeronautical engineer carried on by A. Ogilvie, C.B.E., F.R.A.E.S., at Gwydir Chambers, 104, High Holborn, London, as "Ogilvie and Partners." Subscribers: A. Ogilvie, 3, Hane Crescent, S.W. 1, consulting aeronautical engineer, and F. P. Walsh, 23, Cheyne Court, S.W. 3, civil engineer. Permanent governing director and chairman: A. Ogilvie.

SMITHBROOK ENGINEERING CO., LTD., Smithbrook Engineering Works, Market Street, Chapel-en-le-Frith, Derby.—Capital £1,000, in £5 shares. Aeronautical, agricultural and general engineers, etc. First directors: G. Ibbetson, M. Ibbetson, O. H. Harris and K. N. Harris.

VICTORY DISC WHEEL CO., LTD., 40, High Street, Watford, Herts.—Capital £5,000, in £1 shares. Acquiring patents for inventions relating to (1) improvements in wheels suitable for road vehicles, aeroplanes, etc., and (2) an adjustable air pump indicator for pneumatic tyres. First directors: E. A. Whitfield, H. Everitt, W. Beedle and E. C. Strawbridge.



AERONAUTICAL SPECIFICATIONS PUBLISHED

Abbreviations:—cyl.=cylinder; I.C.=internal combustion; m.=motors.

APPLIED FOR IN 1918

The numbers in brackets are those under which the Specifications will be printed and abridged, etc.

Published October 9, 1919.

- 4,766. A. ANZANI. I.C. engines. (132,282.)
- 9,415. S. HASHIMOTO. Apparatus for measuring thrust of screw propeller. (132,288.)
- 9,815. NIEUPORT AND GENERAL AIRCRAFT CO. and H. P. FOLLAND. Aeroplane joints for. (132,295.)
- 9,926. F. H. PAGE. Landing gear. (132,296.)
- 10,404. T. L. DAVIES and E. W. BOWEN. Aerial propellers. (132,300.)
- 12,730. J. J. B. ARTER and JAMES CYCLE CO. Laying guns for engaging aircraft. (132,308.)
- 14,471. H. C. WATTS. Air screws. (132,321.)
- 14,631. H. N. WYLIE. Metal aeroplane parts. (132,332.)
- 14,632. H. C. WATTS and E. NEAL. Laminated wood air-screws. (132,333.)
- 14,635. UNITED STATES AIRPLANE AND ENGINE CO. Revolving-cylinder I.C. engines. (119,460.)
- 15,062. E. R. CALTHROP. Parachutes. (132,361.)
- 15,202. BIRMINGHAM GUILD and C. A. L. ROBERTS. Aeroplane struts, etc. (132,367.)
- 16,259. B. A. DUNCAN. Girder-like parts of aircraft. (132,376.)
- 19,564. SOC. ANON. DES ATELIERS D'AVIATION, L. BREGUET. Aeroplanes. (128,537.)

APPLIED FOR IN 1919

The numbers in brackets are those under which the Specifications will be printed and abridged, etc.

Published October 9, 1919.

- 6,224. R. FRASSINETTI. Propulsion of aeroplanes. (132,448.)
- 6,636. G. CAPRONI. Multiplane flying-machines. (132,450.)
- 13,470. F. H. PAGE. End connections for aircraft struts. (132,478.)

If you require anything pertaining to aviation, study "FLIGHT'S" Buyers' Guide and Trade Directory, which appears in our advertisement pages each week (see pages xli, xlii, xliii, and xliiv).

NOTICE TO ADVERTISERS

All Advertisement Copy and Blocks must be delivered at the Offices of "FLIGHT," 36, Great Queen Street, Kingsway, W.C. 2, not later than 12 o'clock on Saturday in each week for the following week's issue.

FLIGHT

The Aircraft Engineer and Airships

36, GREAT QUEEN STREET, KINGSWAY, W.C. 2.

Telegraphic address: Truditur, Westcent, London.

Telephone: Gerrard 12818.

SUBSCRIPTION RATES

"FLIGHT" will be forwarded, post free, at the following rates:—

UNITED KINGDOM		ABROAD*	
	s. d.		s. d.
3 Months, Post Free..	7 1	3 Months, Post Free..	8 3
6 " " " " " "	14 1	6 " " " " " "	16 6
12 " " " " " "	28 2	12 " " " " " "	33 0

These rates are subject to any alteration found necessary under War conditions.

* European subscriptions must be remitted in British currency.

Cheques and Post Office Orders should be made payable to the Proprietors of "FLIGHT," 36, Great Queen Street, Kingsway, W.C. 2, and crossed London County and Westminster Bank, otherwise no responsibility will be accepted.